PB-229 715

CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE MONONGAHELA RIVER AND ITS TRIBUTARIES. VOLUME II. HELD AT PITTSBURGH, PENNSYLVANIA ON DECEMBER 17, 1963

Public Health Service
Washington, D.C.

17 December 1963

DISTRIBUTED BY:

NTIS
National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

PB-229 715

CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE MONONGAHELA RIVER AND ITS TRIBUTARIES. VOLUME II. HELD AT PITTSBURGH, PENNSYLVANIA ON DECEMBER 17, 1963

Public Health Service
Washington, D.C.

17 December 1963

DISTRIBUTED BY:

NTIS
National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

PB 229 715

CONFERENCE

in the matter of

Pollution of the Interstate Waters of the

MONONGAHELA RIVER AND ITS TRIBUTARIES

Volume II

December 17, 1963
Pittsburgh, Pennsylvania

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

U.S. Department of Health, Education, and Welfare
Washington, D.C.

277

CONFERENCE

in the matter of

Pollution of the Interstate Waters of the

MONONGAHELA RIVER AND ITS TRIBUTARIES

Volume II

December 17, 1963
Pittsburgh, Pennsylvania

U.S. Department of Health, Education, and Welfare
Washington, D.C.

CONTENTS

STATEMENT OF:

G. A. HOWELL	291
ERNST P. HALL	321
JOHN E. COSTELLO	352
F. R. PERRIN	363
JOHN LAUDADIO	367
F. C. PERKINS	375
BERN WRIGHT	378

AFTERNOON SESSION

2:30 p.m.

MR. STEIN: May we reconvene? Would you all mind coming in and being seated, please?

The conference is reconvened.

Dr. Wilbar?

DR. WILBAR: Thank you, Mr. Chairman.

As I mentioned in my presentation, we have six representatives of State-wide organizations who would present their viewpoints following my presentation, so it is a pleasure for me to call on the representative of the Manufacturing Industries at this time, Mr. Granville A. Howell, who is Assistant to the Administrative Vice President of the United States Steel Corporation, 525 illiam Penn Place, Pittsburgh.

Mr. Howell.

STATEMENT OF GRANVILLE A. HOWELL,
ASSISTANT TO THE VICE PRESIDENT,
UNITED STATES STEEL CORPORATION,
REPRESENTING THE PENNSYLVANIA STATE
CHAMBER OF COMMERCE

G. A. Howell

MR. HOWELL: Thank you, Dr. Wilbar.

Mr. Stein, members of the conference, ladies and gentlemen:

I am Granville A. Howell, Assistant to the Administrative Vice President - Engineering, United States Steel Corporation. The manufacturers on the Monongahela River have accorded me the honor of reporting their progress in safeguarding the quality of Monongahela River water.

Nobody, I think, entirely grasps the significance of the Monongahela River to each of us in the valley.

If the Mississippi is, as Walt Whitman described it, the Father of Waters, then the Monongahela surely is the "rich uncle."

Where, in fact or fiction, has a patriarch so lavishly endowed so large a family?

You and I are Monongahela kinfolk. Our clan also numbers three-score river boat captains, 700 crewmen, twice that many truckers, a legion of coal miners, two thousand merchants and 40 thousand steel men.

About a million of us, all told, are economic dependents of the Monongahela.

I mention the Navy side of the family first, advisedly.

Their forbears were floating coal down the

Monongahela to fire the Fort Duquesne forge in 1753 when George Washington made his famous call at McKeesport on Queen Aliquippa, ruler of the Delawares, and gave her a coat and a bottle of rum. Today, these inland sailors tow 40,000 tons of coal down river every day to stoke 21 miles of steel furnaces between Monessen and Hazelwood.

Unlimited coking coal and river transportation brought steel to the Monongahela and they got on well from the start. Today this abundant trio of coal, steel, and water supplies and supports "this workshop of the world", encompassing five counties which surpasses each of 22 of our States in industrial employment.

Transportation -- topping 28 million tons this year -- hardly dips below the surface, so to speak, in scooping up the abundance of our benefactor, the Monongahela.

Pennsylvanians thrust the heaviest workload on the Monongahela in living and working ashore. They put 3 billion gallons of it to personal and industrial use every day between the West Virginia line and its juncture with the Allegheny.

That accounts for about everybody in the family but you and me, and it's easy to establish our relationship. If you've never seen the Monongahela until today, you're nevertheless a member of the family circle. Monongahela steel may very well have cradled you on the day you were born and every day since you have found use, in some way or other, for products of the Valley's 300-million-ton steel output.

If you served in World War II of Korea, Monongahela Valleyites fought beside you with guns, planes and ammunition forged and machined from 60 million tons of Monongahela steel.

A resourceful uncle indeed, this Monongahela River of ours -- to be treated with utmost respect.

We who work in manufacturing and our families -- there are 300,000 of us altogether -- make up about a third of the Monongahela family. We drink the Monongahela, and bathe in it. We sail in the Monongahela's fast growing fleet of pleasure boats. We heat and cool our homes and water our garden with Monongahela water. Our jobs also depend on it.

The Monongahela plays a substantial part in our manufacturing output that reaches out into the fabric of the free world and returns us a livelihood.

My assignment today is to report manufacturing performance in conserving the health of our rich uncle, the Monongahela.

COMMUNITY-WIDE APPROACH

Just as the Monongahela bestows its abundance on all of us in the Valley family, so also does it impose on us the responsibility for safeguarding water quality -- a responsibility none of us can escape, nor wants to.

The sprawling $100 million disposal plant (Slide 1) at McKees Rocks which treats sanitary wastes of Monongahela Valley communities and industrial plants, illustrates our community-wide approach to water conservation.

Who foots the bill?

All of us. Each of us is reminded of his own personal share when the bill arrives. Our industries have already made direct investments in excess of $10 million for interceptor sewers and, as the principal users in their communities, they pay the largest single share of the sewage treatment charges.

Our community-wide approach to water conservation is working.

RESEARCH

A scientist once described a river as a mobile laboratory. Diagnosis of the Monongahela's capacity for waste assimilation and devising measures for preventing the overtaxing of this capacity have occupied scores of research people over the last 40 years.

Surely, no river has offered research more challenging opportunities. Water conservation problems, of more recent vintage, share priority on the project boards of our research laboratories with others that have plagued us for a century.

We inherited our oldest -- acid mine drainage -- from long exhausted coal mines. We won't have the Monongahela as clean as we want it until Research finds a way to control drainage from these exhausted mines.

Meanwhile, without waiting for the answers to the tremendously difficult problem of mine drainage, our research people have achieved notable success in bringing other sources of pollution under control.

These water pollution control specialists (Slide 2) illustrate their approach to the new pollution problems that confront them every time we produce a new product or install a new process. They are working on corrective equipment to control the waste discharge that will accompany the operation of the new oxygen steelmaking furnaces at Duquesne Works. Before the converters are turning out steel, these specialists will have the water problem under control.

By the time they have solved the OSM problem, however, a new one from another source may require their attention.

Much of the research work is done on the river itself. Here (Slide 3) Paul V. Morgan and Norman Elliott, one of the sample teams directed by Dr. Richard D. Hoak, Research Scientist at Mellon Institute, take river bottom samples on the Monongahela.

ENGINEERS LEAD IN SAFEGUARDING WATER

Once water conservation research has identified the problem and evolved a solution, our engineers take over.

Calling on the technology with which they transformed a pastoral river into a main stream of the Nation's industry and commerce, our engineers have developed laboratory solutions through preliminary design and pilot operation into hundreds of full-scale installations now safeguarding water quality in Monongahela Valley manufacturing plants.

Their pioneer role in every major control advance has established their undisputed leadership in water conservation.

Their work, like research, is never-ending because the problems they must solve are ever changing. They have been engaged, for example, with flue dust disposal since 1923 when they put the Valley's first clarifier on stream (Slide 4) at U.S. Steel's National Works in McKeesport.

They thought they had found the answer to flue dust. But new problems developed. As demands for steel rose, the scrubbers had to handle heavier loads, hotter temperatures, higher velocities and fluffier dust.

With help from Research, the Industry engineers met those demands. They adopted the latest hydrological studies and improved scrubber, filter, and clarifier efficiency

So our engineers are solving the built-in problems of an industrial complex that brought a million people and the world's highest living standards to this Valley.

MANUFACTURING "IN PLANT" CONTROL PROGRESS

The frequently heard charges, "You're substituting research for action" and the companion "The engineer tells us what can't be done and this we don't need to know," meet massive refutation in the water pollution control installatio inventory of the Monongahela Valley's largest manufacturing segment, the steel industry.

STEEL CONSERVATION INVENTORY

The largest industrial water users on the Monongahela are the steel mills. They account for about 68 percent of all water taken from the river for manufacturing. Since the steel mills return substantially all of the water they withdraw, there is no question of water shortages being caused by steel mill operations.

The primary objective of the steel industry in water conservation, one that has occupied research and engineering specialists for the last 40 years, is to return the water with its quality protected for users downstream.

Ninety percent of the steel mill water intake is used for cooling. It absorbs only heat. I was fortunate in having served on a committee of the Pennsylvania Health Department which thoroughly explored the effect of discharging heated water to the river, and whose recommendations resulted in State temperature controls.

The remaining 10 percent of the water pumped into the mills acquires wastes as it performs its washing, quenching, and rinsing role in the steelmaking processes. These wastes include:

1) Blast Furnace Flue Dust
2) Mill Scale
3) Spent Pickle Liquor
4) Lubricants
5) Coke Plant Wastes
6) Sanitary Wastes

Let me take these, one by one, and tell you what the steel industry's progress is to date and the prospects for further improvement in the future.

BLAST FURNACE FLUE DUST

A 28-million-ton charge of air rushes through Monongahela Valley blast furnaces every year in the production of 8 million tons of iron.

Some of the fine ore particles are picked up in this high-velocity stream of heated gas. Two-thirds of the floury dust is recovered dry, but the finer particles elude the dry dust catchers.

Towering cylinders known as wet scrubbers -- measuring as large as 25 feet across and 60 feet high -- intercept these fine particles before they can reach the river. Each of the 32 scrubbers in the Monongahela Valley steel plants is tailor-made to the specifications of the blast furnace it serves.

The dust-laden liquid is pumped to a giant settling basin called a clarifier, where it settles to the bottom in a thick sludge, permitting the clarified water to flow back into the river.

Along the Monongahela eight of these miniature lakes settle out the 500,000 tons of dust captured annually by the scrubbers. As new and better steel plants were built, new and better scrubbers were installed. National Works installed the first one in 1923 and Pittsburgh Steel's Monessen Works modernized this installation (Slide 5) a year ago.

MILL SCALE

The manufacture of various steel products entails rolling hot metal into desired shapes. Hot steel oxidizes rapidly in air, and the scale formed is removed by high-pressure water sprays (Slide 6) and carried in a stream of water to a scale recovery pit.

In the scale pit the water is slowed so the particles of mill scale will settle. Baffles at the outlet end prevent the fine particles from rising and escaping into the river.

Today scores of these scale pits, similar to this one at U.S. Steel's Duquesne Plant (Slide 7), are employed to keep mill scale out of the water.

SPENT PICKLE LIQUOR

"Pickling" in steel mill language refers to the immersion in dilute (Slide 8) sulfuric acid solution by which steel rids itself of the oxide film which has formed after rolling.

The reaction of acid and scale gradually reduces the strength of the solution, and this spent pickle liquor presents the disposal problem.

The first plant for the lime neutralization of spent pickle liquor at Irvin Works was built in 1937. It was completely replaced in 1952 by this modern plant (Slide 9).

Pittsburgh Steel's Allenport and Monessen plants contract for the neutralization and disposal (Slide 10) of its spent pickle liquor.

Jones and Laughlin's Pittsburgh Works has established four storage and truck load-out stations. The spent pickle liquor is contract-hauled and neutralized.

All Monongahela Valley plants meet stringent State regulations governing the handling of spent pickle liquor.

Neutralization is expensive and our efforts will continue to develop a less costly process.

IMPOUNDING OIL WASTES

The skilled Monongahela Valley steelworker, combining such control aids as oil skimmers and automatic lubrication systems with operating know-how, is solving the lubricant pollution problem.

New steelmaking installations are designed, where possible, with automatic lubrication systems that recirculate the oil and re-use it, making its control a simple matter. Many new steelmaking installations use bearings that do not require additional lubrication.

Older equipment presents the principal problem. Recovery systems have been installed so that the sludge and grease can be collected long before it reaches the Monongahela. Spotting, tracing and elimination of oil leaks is a high priority maintenance responsibility in every steel mill.

The complete control of lubricant wastes rests with the operating men who are trained and experienced in using numerous types of oil and grease required in steelmaking.

Lubricant is required on the surface of the sheet of steel as it is (Slide 11) cold rolled. Palm oil is commonly used. I would like to share with you an experience in palm oil recovery as a classic example of how State-industry cooperation gets the job done. This case in point involved the design, engineering and installation of the palm oil recovery plant at Irvin Works (Slide 12). This solution wasn't reached by a yes answer to a flat demand. The question was a complex one with the when part of it completely open. It took four years to write the answer on our drawing boards; three years to engineer and install the prescribed equipment; and now, after three years of operation, we are learning how to make it work efficiently.

At any time along this path, the State regulatory people could have broken off the tedious development of this response to an acknowledged public need, with the quite plausible explanation that "We can't wait. But they understood the problem and, more important, understood what was being done to overcome the technological obstacles to a solution, that would not harm the Monongahela Valley's economy in the solving.

COKE PLANT WASTE CONTROL

Coke plants, along with decaying vegetation and domestic sewage, could contribute phenols in quantities sufficient to give chlorinated water a non-toxic, medicinal taste and odor. To prevent quantities of phenol from entering the Monongahela River, this waste is treated in dephenolizer plants such as the model on this one (Slide 13) at Jones and Laughlin's Hazelwood Works, which recovers substantially all the phenol. The effluent from the dephenolizer is either discharged to the river or evaporated by quenching incandescent coke. As a result there is no deleterious effect on the River. This matter will be more fully discussed in connection with river quality.

SANITARY WASTES GET FULL TREATMENT

Progress in sanitary waste treatment in Monongahela Valley steel communities dramatically illustrates the cooperation of plant and community in solving a local water pollution problem.

Irvin Works constructed the steel industry's first Monongahela Valley sanitary treatment plant in 1937. The other steel plants are either connected to municipal treatment plants or have agreements for connecting up when municipal treatment plants are completed. In those communities served by the Allegheny County Sanitary Authority and McKeesport Joint Authority, all sanitary wastes from the steel plants are currently being treated.

It is a source of great satisfaction to the steel industry that the State of Pennsylvania and the Monongahela Valley communities are supplying leadership in providing sewage treatment throughout this Valley.

OPERATION OF CONTROL EQUIPMENT

Installation of the most advanced control equipment tells only part of Monongahela Valley industry's conservation story. Skilled personnel work around the clock to operate this equipment and maintain it at top efficiency. Charles Dehainaut (Slide 14) performs regular effluent quality tests at Pittsburgh Steel's No. 3 Clarifier.

WATER CONSERVATION AS A PRODUCTION RESPONSIBILITY

The skilled use (Slide 15) of these water sprays by strip mill rollers at J&L's South Side Works illustrate the operator's role in water conservation. Production equipment operators in the Monongahela Valley are trained in the efficient use of water and they regard waste effluent control as a vital part of their job.

OTHER MONONGAHELA INDUSTRIES REPORT COMPARABLE CONTROL PROGRESS

The time allotted for the presentation of this paper today did not permit our sister industries to report in the detail which we have devoted to the steel industry.

Our contemporaries are proud of their water conservation effort, however, and they have asked me to report for them very briefly here. They welcome further inquiry as to the specifics of their progress.

G. A. Howell

The second largest Monongahela water users are the Elrama and Mitchell steam generating plants of Duquesne Power and Light and West Penn Power, respectively. Their daily billion gallon intake is used for boiler feed and cooling. This water only picks up heat and the temperature they add to the water has in no case impaired its value to downstream users.

Chemical processing constitutes a small but vital segment of the Monongahela Valley's manufacturing establishment. The Pennsylvania Industrial Chemical Corporation in Clairton uses water principally for cooling and boiler feed at its Clairton and West Elizabeth plants. President Robert Ostermeyer, Jr. assures me that the small amount of processing used in the Company's manufacturing processes is treated in conformance with State requirements. At Monongahela, Pennsylvania another chemical processing plant treats and recirculates process water so that none of it is discharged into the river.

Fabricators on the Monongahela range from Detroit Steel's Fenestra, Inc. which makes building frames at West Elizabeth to Mesta Machine Company in West Homestead which manufactures one of the heaviest of all commodities -- steel rolling mills. I have assurance that these vital Monongahela Valley plants are meeting or have State-approved plans to meet State treatment requirements.

ECONOMICS

Monongahela Valley manufacturing expenditures for water conservation -- already estimated at $100 million -- have a significance not to be disparaged. Perhaps measurement in our own terms will have more meaning. The figures reveal that $100 has already been expended to protect the water conservation interests of every man, woman, and child in the valley and another $10 will be spent each year in the future for each of us.

These figures are important to everyone in the Valley because each of us has a stake in industry's ability to sell its products in today's competitive world markets.

Our primary concern is that arbitrary imposition of unrealistic water quality standards might affect our ability to compete by compelling us to install treatment processes that are unnecessary to meet our water quality needs.

RIVER QUALITY

So much for "on shore effort. Industry's $100 million purification program has been an exercise in futility if we can't demonstrate "in stream" improvement.

Here (Slide 16) Dr. Richard D. Hoak, Senior Research

Fellow at Mellon Institute makes an important measure of river quality -- its content of dissolved oxygen. Electrodes in glass tank at left continuously sense changes in D.O. concentration. Responses are plotted on strip chart at right.

Surveys of various stretches of the River by Mellon Institute scientists have found D.O. concentration well above the 5 ppm. level prescribed for fish propagation. It was found also that there was very little diurnal variation in D.O. concentrations. For example, in a 24-hour survey at Elizabeth on the Monongahela in July 1960, D.O. concentrations ranged from 7.4 to 8.5 ppm., corresponding to 86 to 90 percent of saturation, respectively. A survey of a six-mile stretch above and below the Clairton Coke Plant of U.S. Steel in April 1962, found D.O. concentrations ranging from 9.7 to 9.9 ppm. A five-day survey of a six-mile stretch above and below the Monessen plant of Pittsburgh Steel in July 1963, showed D.O. concentrations of 7.4 to 7.7 ppm. Another survey of the same stretch in October 1963, found concentrations of 8.8 to 9.7 ppm. These representative data indicate that the dissolved oxygen resources of the River are more than ample.

Studies of phenol concentrations on the Monongahela River are particularly important to this Conference, in our opinion, for the vital knowledge they provide in two aspects of river quality improvement long identified with this chemical.

First, they have disproved the time-honored identification of steel industry coke plants as the principal cause of objectionable taste and odor in our drinking water.

It might be useful in understanding the persistence of this association to refer back to conditions on the river 40 years ago.

In the 1920's the coke plant along the Ohio River and its tributaries were dumping large quantities of phenolic wastes into the river and causing almost continuous medicinal taste and odor problems in the finished waters at the many downstream plants. Rather drastic reforms were instituted to bring the problem under control. As an example, Clairton Coke Plant started the practice of using coke plant wastes for quenching coke, thus keeping these chemicals out of the river.

Since phenol was the major impurity in the waste and since chlorinated phenols definitely have an odor and taste, it was easy to associate, thereafter, all taste and odor problems at water works with phenolic wastes from coke plants. Therefore, when occasional outbreaks of taste and odor problems continue to occur, regulatory personnel tend to blame the problems on accidental discharges from coke plants.

An important gain in dropping coke plants from top listing among phenol taste and odor sources was scored in 1953 at a winter meeting between the Engineering Committee of ORSANCO and the steel industry representatives. At this meeting a possible phenol limit of 5 parts per billion was suggested by ORSANCO. The urgency for the meeting was a particular taste and odor problem which apparently had just been experienced by almost all the water works on the Monongahela and Ohio Rivers. This problem had been blamed by the regulatory personnel on coke plant discharges. It became obvious that all of the coke plants could not be guilty of discharging large amounts of wastes simultaneously. After a thorough study, regulatory personnel decided this particular problem was probably due to discharge from the Tygart Dam, upstream on the Monongahela watershed in West Virginia.

Further evidence removing the steel industry as the target for phenol responsibility was provided during two industry-wide steel strikes.

Samples of raw water were analyzed for phenol daily for two months during the 1956 and 1959 steel strikes when the Steel Industry was not operating. Two of the sampling points of the 1953-55 survey were used. The findings were compared with a comparable period in 1954. It was found that there was no appreciable difference in phenol concentration for the two periods. In illustration, these data will be of interest:

(Slide 17)

Range of Phenol Concentrations, ppb.

	1954	1956	1959
Monessen	1 - 3	0 - 3	0 - 4
Glenwood	1 - 9	0 - 21	-

In surveys made over 10-day periods above and below the Monessen plant of Pittsburgh Steel in July and October, 1963, it was interesting that phenol concentrations ranged from 0 to 14 ppb. in the first period and 3 to 9 ppb. in the second at a point 0.8 mile above Pittsburgh Steel. The data from those two surveys are shown on this slide.

(Slide 18)

Ranges of Phenol Concentrations in Monongahela River

Sampling Point, Miles from Plant	Phenol, ppb. (July)	Phenol, ppb. (October)
- 0.8	0 - 14	3 - 9
3.0	0 - 13	3 - 9
7.3	0 - 12	5 - 16

Although these data show that phenol concentrations were slightly higher in July and October, 1963, at distances below the plant than above the plant, the concentrations found are far too low to cause difficulties at the water works. These surveys show that coke plants in normal operations have no appreciable effect on phenol concentrations in the Monongahela. Problems can arise when accidental spills occur, but a monitor is now being developed that will signal an increase of phenol in coke plant waste water so that corrective action can be taken immediately.

The second breakthrough in our knowledge of phenol was contributed by seven water works operators on the Monongahela and Ohio. Their analysis of water samples for phenol and odor during the period January-April 1956, established beyond question that currently accepted phenol concentration limits of 1 to 5 ppb. are unrealistic. Out of 962 samples containing phenol in concentrations ranging up to 200 ppb., they found only 26 instances in which medicinal odor was present in the treated water. This is illustrated by three slides which show the complete lack of correlation between phenol concentration and odor.

Slide 19: As shown on this slide, 200 samplings reveal 18 medicinal odor occurrences on days when phenol concentration ranged from 5 to 53 ppb. No correlation.

At Weirton there was one medicinal odor occurrence in 90 samplings which varied in phenol concentration from 1 to 69 ppb.

Slide 20: Here we observe no medicinal taste occurrences at Wheeling in 81 samples which varied from 1 to

200 + ppb. phenol.

Seventy-nine samplings at Cincinnati show no medicinal odor with phenol concentration ranging from zero to 25 ppb.

Louisville reported five occurrences of medicinal odor in 117 samplings which ranged from zero to 21 in phenol ppb. It is notable that one case of medicinal odor occurred at zero phenol.

Slide 21: Here we find no medicinal odor occurrence in 21 samplings on the Monongahela at South Pittsburgh even though it is downstream from three coke plants, one of them the world's largest. Phenol ppb. ranged from 1 to 26.

Beaver Falls reported three instances of medicinal odor out of 366 phenol determinations ranging from zero to 56 ppb. These three instances occurred at phenol concentrations of 4, 10, and 18 ppb. but there was no medicinal odor in connection with any of the concentrations above 18 ppb. ranging up to 56 ppb.

In 1953-55, the steel industry conducted a phenol survey on the Monongahela River which showed phenol concentrations ranging from zero to 409 ppb. There were no complaints from water works about medicinal odor during the survey period.

The conflict between these findings and the generally accepted phenol limits of one to five ppb. may be traced to some poor laboratory work in the 20's. Since at that time there was no available analytical method for determining phenol in concentrations of a few parts per billion, the investigators prepared a concentration solution of phenol which was chlorinated. The sample was then diluted with pure water until it was agreed that the medicinal odor had disappeared. The concentration of phenol was calculated as about 5 parts per billion. This became a generally acceptable value, which has been revised downward until now the U.S. Public Health Service is recommending one part per billion.

It is quite apparent that the technique used in the laboratory differed from that carried on at a water works, where water containing some parts per billion phenol is taken into the plant and chlorine added. In the latter case, we are dealing with the chemistry of very dilute solutions. It is known that the chemical reactions taking place may be quite different than those taking place in concentrated solutions.

So much for scientific evidence. Are the figures borne out in tangible manifestations of improvement?

To answer this question in a way that would be meaningful for this Conference, I've turned to the proprietors of four Monongahela River enterprises devoted exclusively to the sale of marine equipment.

As we anticipated, we found them straight-talking businessmen. Obviously their primary allegiance is to the thousands of boating fans on the Monongahela who buy their equipment.

However, I think this Conference will be interested in their opinions about the Monongahela and I will report the statements they have voluntarily made.

Homer Brewer, a director of the Elizabeth Boat Club and owner of Brewer's Marine in West Elizabeth, had this to say:

> "While the Monongahela is a long way from clean enough to suit us, there has been a definite improvement on the Monongahela since I opened up 10 years ago and particularly in the last 5 years.
>
> "Ten years ago only dare-devil kids would swim in the second pool. Now on weekends the river actually competes with swimming pools for bathers. My boy is in the river all summer long.
>
> "We still get complaints about oil at the Elizabeth Boat Club and when we trace them to a storage farm or an industrial plant we get quick action. There seems to be a new spirit of cooperation. Everybody's interested in the river and our business is growing.
>
> "I sold a single outboard in 1953, the year

I opened up. So far this year I have sold 75 outboards and 25 motorboat outfits."

Wayne Cramer, co-proprietor of Cramer Brothers Marine Sales and Service, Elizabeth commented:

"There are a lot of problems in cleaning up the industrial river and we are glad to report a steady improvement in the Monongahela quality. The water in our pool looks a lot better and more people are boating, swimming, and water skiing."

William E. Kucchi, Manager, Leonatti Brothers, Inc., Duquesne dealers in marine equipment stated:

"Hundreds of people who operate boats on the Monongahela come into our marine store and the consensus of their opinions is that the Monongahela is definitely cleaner. Water skiing has picked up tremendously and the fishermen are getting good catches of catfish."

Mrs. A. R. Skager -- Skager Boat and Marine Sales in Duquesne said:

"There has been a definite improvement in the quality of the Monongahela and while there is a good way to go, we feel that progress is being made in cleaning up the Monongahela."

Gentlemen, these business people represent an important new addition to the economy of the Monongahela

Valley. I submit their opinions as significant contributions to this Conference.

We, in industry, are gratified that our 40-year abatement effort is producing tangible results.

STATE ENGINEERS VIGILANT, HELPFUL

The Engineers of the Pennsylvania Health Department's Sanitary Engineering Division work closely with our plants on frequent inspection trips and they keep tabs on our control progress through monthly performance reports. They know what our problems are and show a preference for working them out on a person-to-person basis.

The State people have played a strong hand in the cleaning up of the Monongahela and we look forward to the continued guidance and assistance of these dedicated professionals.

Thus, do the manufacturing members fulfill their family responsibility for safeguarding the Monongahela's water quality. We believe our control program, developed in cooperation with local agencies, works to benefit the people who live and work along the shore of this great river.

Thank you.

(Applause.)

MR. STEIN: Are there any questions or comments?

(No response.)

MR. STEIN: Thank you very much, Mr. Howell, for a very excellent statement.

I might say that those were some of the best slides I have ever seen. I don't know what your process is, but they have really been wonderful.

Are there any comments or questions?

MR. WRIGHT: Mr. Chairman.

MR. STEIN: Yes.

MR. WRIGHT: I have one question to ask Mr. Howell.

In his presentation he mentioned that one of the taste and odor problems apparently was traced to the Tygart River Valley Dam. I am wondering if you would care to elaborate on that problem.

MR. HOWELL: The assumption was that the decaying vegetation, that we all know produce phenolic tastes and odors and things of that sort, was discharged in the water when they opened up the Tygart Dam. That was the assumption.

MR. WRIGHT: Thank you, sir.

MR. STEIN: Are there any further questions or comments?

(No response.)

MR. STEIN: I don't know, but you may want to comment further on this, Mr. Howell. I don't know that it needs any comment, but your last remark was the decaying vegetation, which we all know, leads to phenolic tastes and odors. I am not sure we all know that.

MR. HOWELL: We know that that is a contributing factor.

MR. STEIN: To taste and odor, but not necessarily a phenolic taste and odor.

MR. HOWELL: A medicinal taste and odor.

MR. STEIN: Thank you.

MR. HOWELL: Yes, sir.

MR. STEIN: Thank you.

Dr. Wilbar?

DR. WILBAR: Thank you, Mr. Howell.

The next person will be the representative of the Mining Industry, Mr. Ernst P. Hall, Research Consultant, Consolidation Coal Company, Koppers Building, Pittsburgh. Mr. Hall.

STATEMENT OF ERNST P. HALL, RESEARCH CONSULTANT, CONSOLIDATION COAL COMPANY, REPRESENTING MINING INDUSTRY

MR. HALL: Thank you, Dr. Wilbar.

Mr. Stein, conferees, ladies and gentlemen:

Dr. Wilbar has requested that, if possible, I shorten the statement as much as possible, and I will attempt to do that. I have submitted a copy for the record, and I would hope that the statement will be in the record in its entirety.

MR. STEIN: Without objection, the full copy will appear in the record as read.

MR. HALL: I am Ernst P. Hall and I am representing the bituminous coal industry in the Monongahela Valley. This includes some 25,000 persons employed by the industry and 1.1 million persons indirectly influenced by the Monongahela coal industry.

I am appearing at the invitation of the State of West Virginia and at the request of the Commonwealth of Pennsylvania and the Pollution Abatement Committee of the Pennsylvania Chamber of Commerce.

I hold engineering degrees from West Virginia

University and the University of Pittsburgh and am a registered professional engineer in Ohio, West Virginia, and Pennsylvania. I am a member of the American Chemical Society, American Institute of Chemical Engineers, American Society of Mechanical Engineers, American Institute of Mining, Metallurgical and Petroleum Engineers, Land and Water Use Committee of the National Coal Association, Land and Water Use Technical Subcommittee of the American Mining Congress, and Secretary of the Coal Industry Advisory Committee to ORSANCO.

I have authored several technical papers on the control of acid mine drainage, a subject which I have been interested in and have actively worked on for many years. I first came in contact with this natural phenomenon while a student at West Virginia University. I was involved in intensive research on the disposal of acid forming coal wastes while a Fellow at Mellon Institute. As a Research Consultant for Consolidation Coal Company, I am concerned with the administrative and technical responsibilities resulting from acid drainage.

In this statement, I will prove four major points about acid drainage in the Monongahela Valley.

These points are:

1. Acid drainage is natural and existed thousands of years before the first coal mine.

2. The coal industry in the Monongahela Valley is presently spending more than $3 million annually to control water pollution.

3. ORSANCO has done an excellent job of enforcement by gaining the compliance and cooperation of the coal industry in control measures and in seeking of long range solutions through research, thus eliminating the need for Federal control.

4. Federal assistance and guidance can best come in the form of research grants to States and other qualified agencies.

But let's start at the beginning, about 5,000 years ago. The discharge of yellow sulfurous water from coal and related strata has apparently been occurring since before the beginnings of recorded history. Explorers charting the virgin Allegheny Mountain area discovered substantial deposits of coal when they noted that certain creeks and springs issuing from the hills were yellow and sulfurous. They presumed the presence of coal deposits because of the similarity of this water to that issuing from coal mines in England and in Europe.

The following observations are typical of those made by early explorers of the Allegheny Mountains.

Gabriel Thomas, 1698:

" ... and I have reason to believe there are good coals also, for I have observed the Runs of Water have the same colour as that which proceeds from the Coal-Mines in Wales."

T. M. Harris, 1803:

"But the spring water, issuing through fissures in the hills, which are only masses of coal, is so impregnated with bituminous and sulfurous particles as to be frequently nauseous to the taste and prejudicial to the health."

Frederick Pursh, 1806:

"The water is very strongly sulfurous and used to flow which is very remarkable, at different times of different colors, from quite clear to muddy, and of all shades of red, yellow and blue."

The names of many streams are related to the early condition of the water, such as Coal River, Redstone Creek, Yellow Britches Creek, and others. The historical legends surrounding these names may not always be accurate but they leave little doubt that the mineral coal did affect the character of water in the Allegheny Mountain area.

The formation and drainage of acid water from coal and related measures is a natural reaction and occurrence. It has only been increased by the mining of bituminous coal.

Acid drainage occurs when water, flowing over and through measures containing oxidized pyritic sulfur, dissolves and carries away the acid oxidation products of the coal and related measures. Mining does not deliberately produce water or acid drainage. But, in the normal process of mining, water drains into the mine and must be removed for the safety of the miners and to permit mining to continue. Occasionally, surface water from a definite source, such as a creek or pond enters a mine. It sometimes enters through a well-defined opening. More often, however, water enters the mine from underground aquifers, seeping through a relatively large area so that its point of entry and source are vague and indeterminate. As water drains into and through the mine, it may pass over acid-producing minerals, which have been exposed to the atmosphere by the mining process. Some of the minerals dissolve and are carried away by the water to give drainage its acidic nature.

It should be emphasized that all coal mine drainage is not acid. Drainage from some areas of the Nation is almost never acid, while mine drainage in other areas is often acid. Drainage in the Monongahela Valley falls in the latter category But even in the Monongahela Valley there are many instances of specific mine drainages which are not acid, but of good quality and character. In an even greater number of instances, the volume and acidity of a mine drainage is small when compared to the receiving stream and causes no significant water degradation.

Acid mine drainage is not industrial waste in the normal definition of the term. Water drainage into a mine is a completely natural occurrence, as is the formation of the acid salts which the water may dissolve and transport. The water is neither wanted nor permitted to enter a mine when it can reasonably be prevented, but if it does, it must be removed. Thus, drainage water plays no productive role, either directly or indirectly, in the mining of coal and is not used in the mining process as industrial waste waters are normally used in industrial processes. In fact, its removal is a significant item in production cost of coal mining. Additionally, mine drainage will usually continue even if a mining operation is terminated, whereas normal industrial discharge of waste water ceases almost immediately when the industrial operation is stopped. Therefore, acid drainage cannot be characterized as an industrial waste, as that term is normally used, nor can it be treated or corrected using those tools normally applied to industrial waste water discharges.

In addition to its acidic nature, mine drainage may contain high amounts of sulfates, calcium and magnesium hardness, iron, and occasionally other heavy metals. When these materials enter a stream they may change the color of the water. This may offend the esthetic sense of persons viewing the stream. These materials also may reduce the utility of water for certain recreational uses. But acid drainage does not restrict the use of stream water for municipal and industrial purposes. The fact that acid mine drainage does not preclude the use of water as a municipal water supply is repeatedly documented in the Monongahela Valley, from Clarksburg on the West Fork River, to the South Pittsburgh water intake.

Considering that acid drainage has been discharged into the Monongahela basin for approximately 200 years and that these waters have and are still being used for both municipal and industrial purposes, the coal industry contends it has not adversely affected the health of persons residing in the valley. After all, our management personnel, our employees and many friends live in the valley. If health were a problem, we would be the first to admit it and the first to take positive action against it. The public has not been hurt and no knowledgeable organization is contending that acid mine drainage has created a health problem in this valley.

Any contention that the coal industry is adversely affecting the welfare of the valley is also erroneous. Without the coal industry there would be some 75,000 or more persons added to the jobless roles. Without the coal industry the economy of the valley would be poorer to the tune of at least $300 million per year. I have yet to hear proof that any industry which creates jobs and pays top wages is hurting the welfare of any area or community.

The coal industry in the Monongahela Valley is presently spending more than $3 million annually to control water pollution.

The coal industry recognizes that acid drainage may cause an undesirable effect on receiving streams for fishing and other recreational uses. Indeed, the industry's realization of its civic responsibilities has prompted active research efforts to determine the overall nature of acid mine drainage and to mitigate effects of this drainage. Since 1944, the coal industry has supported or cooperated in all significant research projects to determine the overall nature of acid mine drainage. The industry has participated in all of the applications resulting from research into drainage phenomenon. In fact, from these research programs has come practically all of the fundamental information which today comprises the storehouse of technology about the formation, discharge, and control of mine drainage.

For example, all of the information developed by the various coal industry research projects has been made readily available to one or more branches of local government concerned with the problem. Concepts developed at West Virginia University have been published in reports of the University Experiment Station. The coal industry has made public the results of the research by Mellon Institute through reports and publications. The industry has cooperated with the Pennsylvania Sanitary Water Board and the West Virginia Division of Natural Resources by making available these reports and publications, and private data and results. Additionally, the coal industry has made field evaluations and field applications of the principles and practices developed by this research.

The coal industry has actively participated, through the Coal Industry Advisory Committee to ORSANCO, in aiding and assisting ORSANCO in drafting realistic regulations for the control of acid drainage. The industry assisted ORSANCO in the preparation of a manual entitled, Principles and Guide to Practices in the Control of Acid Mine Drainage, Supplemented by Case Histories. This manula, coupled with ORSANCO Resolution No. 5-60, constitutes the first major governmental effort to apply reasonable restrictions to all the discharges of acid mine drainage.

Let me further illustrate that the coal industry is fully aware of its responsibilities and is actively working on water pollution caused by coal mining and coal preparation. In cooperation with enforcement agencies in Pennsylvania and West Virginia, the coal industry installed the facilities and equipment to remove excessive black solids from water before it is discharged from coal preparation plants. This control program has been so effective that the discharge of black solids has been almost eliminated from the Monongahela Valley. Further tribute to the success of this program is paid by the virtual omission of this aspect of water pollution from the Health, Education & Welfare Monongahela Valley report.

A recent survey of coal mining companies operating in the Monongahela Valley indicates that one or more measures are being taken at every major coal mine to control, reduce and/or ameliorate the undesirable effects of mine drainage. This survey of coal mining companies located in the Monongahela Valley also indicates expenditures for the control of water pollution at the rate of more than 5 cents per ton of coal mined. This means that the coal industry in the Monongahela Valley is currently spending more than $3 million per year on water pollution control.

There are many examples of projects being carried out by various Monongahela Valley companies and mines. One mining company has installed large settling ponds on each of its mine drainage discharges where the necessary land could be obtained so iron particles carried with the drainage would be settled out rather than discharged to the streams.

Another mining company has drilled wells, and pumps fresh alkaline water out of the ground to mix with acid mine drainage. The resulting effluent is neutral and of acceptable quality.

In another instance a mining company has constructed a huge pond into which mine drainage is discharged during the dry summer months when nearby streams are low, and held until winter when it is discharged in the heavy winter flow. If this mine drainage were discharged during the summer it would undoubtedly contribute to some degradation of the stream. Discharged during the winter months, when the flow is high there is little if any effect on the stream. At another mine, where water is needed for preparation plant use, mine drainage from almost all parts of the underground mine is pumped through pipes to a central sump and then lifted to the surface to be mixed with available surface water and impounded for use in the preparation plant. Because of this impoundment and use there is no discharge of acid drainage to the streams from the mine.

These are only a few of the many ways in which the coal industry is attempting to minimize the effect of mine drainage on the receiving streams. I have described a few

examples to show that the coal industry is exploring every measure which is technologically feasible and economically reasonable to control problems which may be caused by mine drainage.

Admittedly, no one today knows how to eliminate acid drainage from idle and exhausted mines. We can and are minimizing each year the effect of that drainage from existing mines. The industry in this area is annually spending $3 million -- $1 million a year more than the alleged damages -- in an effort to reduce water pollution. But the important consideration is simply this -- whatever else is to be suggested or considered in an effort to further reduce the effect of the acid drainage, it must certainly be viewed in the light of the tremendous economic significance the coal industry has to the Monongahela River Valley.

In 1962 the coal industry in the area, subject to this hearing, mined approximately 57 million tons of coal. 20,192 miners were directly employed in producing this coal, representing an annual payroll of more than $121 million. The companies producing this coal spent more than $94 million in the purchase of material, supplies and power to operate the mines that produce this coal. We do not have complete data on the total local property taxes paid by these mining companies, but we do know that the total is large and a significant portion of the local economy. For example, in Greene County, Pennsylvania, the 1961 assessed valuation of coal was 53.3 percent of the total assessed valuation of all property in the county. To all of this must be added the thousands of employees in collateral industries that produce the equipment needed to operate the mines that provide needed retail services for the mine employees, and that transport the coal to market.

The coal industry today is fighting a severe competitive battle to retain its position in the market place. Coal from the Monongahela Valley must compete with other coals oil, gas, and atomic power and in competing with these other fuels its only effective weapon is its ability to keep its prices competitive. To accomplish this objective, the industry has and must continue to keep its costs at the lowest possible level. The industry's present expenditures to alleviate water pollution clearly testify to its awareness of the obligation to find a reasonable solution to the acid drainage problem. But the industry's urgent need to retain its competitive position points up the necessity of finding a solution that is both practical and economically feasible.

A sound coal industry is essential to the Monongahela Valley because of the dependence of steelmaking on this essential raw material. It is common knowledge that a prime factor in the development of the steel industry in the Monongahela and Ohio Valleys was the vast quantity of high-grade metallurgical coal available at relatively low costs. If the steel industry in the entire upper Ohio Valley is to remain competitive, it must continue to have available to it these coal resources at an economically attractive cost.

When the total economic effect of the coal industry, plus the steel industry, plus other industries which are directly and immediately dependent on both of these major basic industries is considered, more than 90 percent of the economic life of the Monongahela Valley is based on the availability of large quantities of economically attractive coal.

In its presentation which is available in printed form and is yet to be given, H.E.W. estimates that acid mine drainage in the Monongahela River causes estimated damages in the amount of $2,251,000 per year, primarily to water treatment plants and boats and barges using the river dam installations. While we do not desire to argue the amount of these alleged damages, we suggest that these claims should be viewed in their proper economic perspective.

The Department of Health, Education, and Welfare presentation contains a number of points we feel should be discussed and should be supplemented with additional data and information. The data reported in the H.E.W. statement was collected during a very brief period in August and September of this year. Certainly this three-week period is too brief to give a clear picture of the year-round conditions in the Monongahela River. This is especially true because of the unusual weather conditions during and prior to the test period. It should also be noted that much of the data reported as the basis for this conference was collected after the August 7 call for the conference.

It is a commonly accepted fact, which has been documented through research and study, that acid mine drainage can and does inhibit and destroy many pathogenic organisms which may find their way into surface waters. The high degrees of bacterial pollution which are theoretically possible have not developed in the Monongahela basin primarily due to the sterilizing effect of the acid mine drainage present in these rivers.

It is alleged that the sterilizing effect of acid mine drainage will be much less at periods of high flow. This, of course, is speculative and should be documented with particular technical data demonstrating this to be a general fact and conclusion before it is accepted as a fact in this report.

The monetary damages estimated by the H.E.W. report are not documented as to their source or the method by which they were estimated. The fact that this documentation or method of estimation is absent makes it virtually impossible for anyone other than the author of the report to recheck the calculations and determine the applicability of many assumptions which must necessarily have been made to arrive at this sort of estimate. More information is needed so that all concerned can either agree or define the areas in which they do not agree with the estimate made.

The H.E.W. report indicates that the condition of the Monongahela River has grown considerably worse over the past many years, and particularly since the 1940 studies. This conclusion does not agree with the conclusion drawn in the Commonwealth of Pennsylvania's presentation which showed in tabular form that the acidity in the Monongahela River had decreased slowly but steadily since approximately 1940. A careful study of the data presented in Table No. 4 of the H.E.W. report indicates the following comparison between selected hot phenolphthalein acidities as determined in 1940 and in 1963.

Station	Location	Acidity mg/1-1940	Hot to Phenol mg/1-1963
M-1	Monongahela River, Charleroi, Pa.	35	24
M-5	Monongahela River, Morgantown, W. Va.	46	23
MW-9	West Fork, Monongah, W. Va.	58	28

This comparison of acidities in 1940 and in 1963 would indicate that many of the streams were less acid in 1963 than in 1940 and leads to a severe doubt as to the validity of this conclusion as reached in the discussion portion of the H.E.W. report. In fact, on the basis of these acidities, it would appear that these streams are in considerably better condition than they were in 1940 and that in some cases there is only half as much acidity present in the water as there was 23 years ago. Inasmuch as the concentration of acid in the waters is the real criteria of effect of acid on water, rather than gross quantity of acid discharged into the streams in tons per year or per day, we feel that the data collected by H.E.W. really indicate an improvement in the streams and that this improvement is of such magnitude that the State of West Virginia, the Commonwealth of Pennsylvania, ORSANCO and the coal industry should be applauded for having done a commendable job in reducing the effect of acid mine drainage into the Monongahela River basin.

ORSANCO has done an excellent job of enforcement by gaining the compliance and cooperation of the coal industry in control measures and in the seeking of long range solutions through research, thus eliminating the need for Federal control.

During the past 20 years, as a result of the research and application efforts of the coal industry, and in cooperation with the States and ORSANCO, much progress has been made in relieving the undesirable effects of water discharged from the mining and processing of bituminous coal. The discharge of black water from coal preparation plants has been virtually eliminated in the Monongahela Valley. This has been accomplished through the efforts of the State regulatory agencies and the coal industry itself. It has required that each coal processing unit survey its needs and install equipment and facilities to properly control its waste water.

As a direct result of research efforts, surface mining can be conducted in such a way that acid drainage from these mines is held to a minimum and, in a great majority of cases, surface mining can be conducted without discharging any acid drainage from these mines. Almost all of the surface mines causing problems from acid drainage were in operation before present-day regulations were established. Proper reclamation of these areas affords permanent insurance against the discharge of acid drainage from this type of mining.

Underground mining presents the most difficult problem of acid mine drainage control but even in this difficult area progress has been made. ORSANCO Resolution 5-60 has been accepted by the coal industry and is presently being implemented throughout the entire Valley. Additionally, underground mines are being experimentally operated to test basic theories on the prevention of acid drainage in active mines. The first of these experiments began in 1956 and to date, it appears favorable; however, we cannot yet draw final conclusions.

The States of Pennsylvania and West Virginia and ORSANCO have been quite active in carrying out their responsibilities to police and control water pollution in this area. Pennsylvania established a system of mine drainage permits in 1946 and since then has pursued a program designed to maintain the quality of streams in the basin. West Virginia has more recently adopted a system of mine discharge permits and is requiring that consideration be given to water pollution control factors. The State also requires that water pollution control facilities be installed where such facilities will be beneficial. The acid mine drainage measures by ORSANCO were to be and are being implemented and directed by the State water pollution control agencies in Pennsylvania and West Virginia.

It is evident that the States and ORSANCO have the legal authority to and are diligently effecting water pollution control where bituminous coal mining is concerned. Because these States have been and are effectively policing water pollution, we believe that no additional policing action by any Federal agency is either necessary or desirable. As a matter of fact, we are firmly convinced that the intrustion of the Federal Government into this problem could only result in confusion, dilution and duplication of effort, and a general reduction in the effectiveness and direction of programs now under way.

We believe that this problem is capable of a final solution, but we do believe that a rational solution to it will require the considered and concerted effort of all concerned -- the industry, the States, and the Federal Government. The solution to the problem of acid drainage from idle and exhausted mines and areas is not known today and must be found and tested before it can be adopted and used extensively. To find possible solutions and prove them to be effective and practicable will require considerable research and demonstration.

Over the past 50 years many solutions to the problem of drainage from idle and exhausted mines have been suggested, tested, and universally found to be something less than perfect. One of the earlier proposed solutions suggested that the whole problem could be solved simply installing boxes containing limestone under the discharge of each drainage point so that the acid mine drainage passes through and over the limestone and becomes neutralized before it is discharged into the river. The fact that no installations of this type are presently in service is mute testimony to their ineffectiveness. During the 1930's, the Federal Government spent many millions of dollars to seal abandoned coal mines by using a siphon-trap type of seal. In theory, this was an excellent proposal as it was intended to eliminate the air from coal mines, thereby preventing the formation of acid and acid mine drainage. Unfortunately, the proponents of this method failed to recognize that air has access to almost all abandoned mines through cracks and fissures and other almost microscopic openings in the soil, so that sealing only the man-made entries was ineffective. Many people today still hold a lingering hope for the success of this type of acid drainage control even though it has proven to be ineffective and even though a 15-year scientific study has demonstrated beyond any reasonable doubt that siphon-trap sealing of shallow-cover mines does not reduce the amount of acid discharged and does not result in improvement of the receiving stream. Many other proposals have been tested and found deficient in one or more respects.

We have found through experimentation, and documented through repeated use, that the permanent inundation of the acid-producing materials will completely inhibit any significant formation of acid and prevent the formation and discharge of acid mine drainage. We also know that flowing water must dissolve and carry acid salts out of the mine for mine drainage to be acid. The industry believes these facts point the way for, first, research to establish and, later, demonstration projects to demonstrate the solution to the problems of acid mine drainage from idle and exhausted mines.

If the problem of controlling and preventing the formation and discharge of acid from exhausted coal mines was an easy one, I can assure you that it would have been solved many years ago and the problem would not be present today. Unfortunately, it is quite complex and is further complicated by the fact that the interior of most of these exhausted mines is totally inaccessible. In finding realistic solutions to this problem, it will be necessary to bring the full consideration of many different disciplines to bear upon it. As the solution to it appears to be dependent on factors of geology, hydrology, soil mechanics, mining technology, and related disciplines, it is readily apparent that research on the problem must be carried out by people having a very high degree of knowledge and skills in these disciplines. After the basic technology has been developed, it must then be tested and demonstrated under field conditions. To do this, the service of skilled engineers is necessary and the evaluation of both the effectiveness and the economics of this new technology must be given careful consideration by a team of specialists having special experience in these fields.

In instituting programs in this research area, we believe that the primary responsibility for these research and demonstration projects and for any future large-scale application of them should lie with the individual States. As these programs are of a massive nature and will undoubtedly require the expenditure of large sums of money, they may exceed the financial capabilities of the States involved.

Federal assistance and guidance can best come in the form of research grants to States and other qualified agencies.

It appears logical that the Federal Government should assist the States, (1) through coordinated Federal, interstate, and State research; (2) through grants-in-aid to the States for research and demonstration; and (3) through grants to the States for large-scale application of the control methods developed by research.

The research program is principally involved with soil, mining, etc., rather than matters of health. Because of the disciplines involved with this program and because special knowledge and skills in these disciplines is principally available in the Department of the Interior, the principal Federal responsibility for conducting and cooperating in these programs should be vested in this department or Federal and State bodies, such as ORSANCO, created specifically for this purpose. In a recent letter from Secretary Udall of the Department of the Interior to Congressman Jones of Alabama, Mr. Udall pointed out that the Department of the Interior through the Bureau of Mines has prepared and is in a position to undertake, subject to the availability of appropriations support and manpower, a program intended to develop information necessary for the planning and development of a program for controlling acid mine drainage. This program would require three years for completion and probably require several million dollars, although the Secretary does not discuss this point. I believe this letter is of such importance that I am attaching it as an addendum to this statement.

(The letter referred to is as follows:)

E. P. Hall

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
Washington 25, D.C.

July 30, 1963

Dear Mr. Jones:

Thank you for the recent opportunity afforded this Department to testify on the subjects of water quality and water pollution before Hearings of the Natural Resources and Power Subcommittee, House Committee on Government Operations.

During the testimony of Director Ankeny, Bureau of Mines, your Committee sought from him legislative recommendations to curb stream pollution from acid mine drainage. None were offered because it was felt that basic information for such recommendations is lacking and Director Ankeny so testified. Moreover, he could not then provide your Committee with an estimate of time required before such recommendations could be soundly made.

We are pleased to inform you that three Interior bureaus (Mines, Sport Fisheries and Wildlife, and Geological Survey) have since been at work developing a program that can provide essential missing information. Subject to availability of appropriations support and manpower, Interior will be in a position to make solidly based legislative recommendations within 3 years. Because of the enormous complexity of the acid mine drainage problem, we believe that recommendations made in advance of completion of the contemplated program of work would fall short of acceptable standards in that they would lack a sound factual basis. In brief, the jointly developing program contemplates:

1. Selection of suitable drainage areas of limited extent (50 to 500 square miles).

2. Comprehensive correlation of geologic, hydrologic, mining and stream biology features of areas selected.

3. Comprehensive application of the best presently known acid drainage control measures throughout the drainage areas (Surface water diversion, mine sealing where engineering studies support the feasibility, etc.).

4. Assessment of the areas' drainage problem as found and as altered by control, followed by use of the information to project what can be done to control the problem throughout the United States.

5. As a concluding step, submitting recommendations to the Congress regarding a nationwide control program -- its initial cost, its maintenance cost, and its anticipated effectiveness in solving the problem.

Concurrently, the proposed program would be supplemented by other studies among Interior's bureaus to define and assess the total acid mine drainage problem, as well as to develop other information leading toward its economically practical solution.

We are grateful to your Committee for stimulating our development of an intensified attack on the acid mine drainage problem. We trust that it will be a program both deserving of and receiving support at all levels of consideration.

Sincerely yours,
/s/ Stewart L. Udall
Secretary of the Interior

Hon. Robert E. Jones
Chairman, Natural Resources
and Power Subcommittee
Committee on Government Operations
House of Representatives
Washington 25, D. C.

- - -

This letter is an indication that the Department of the Interior is making a determined effort to accept its responsibilities and find practicable and workable solutions to this problem. We look forward to the Department of the Interior's efforts with considerable hope that they will be successful.

In addition to the studies to be conducted by the Department of the Interior, the President's Appalachian Regional Committee, based upon its studies, has just recommended a long-range and comprehensive study of the acid mine water problem. The attached recommendations of the Committee reveal the thoroughness of the study to be made. With studies being undertaken by the Department of the Interior, Appalachian Regional Commission, ORSANCO and the States bordering on the Ohio River basin, every effort should be made by H.E.W. to avoid a duplication of effort in these areas.

I might add that this presentation has been reviewed and concurred in by all of the major coal producing companies in the valley, both Pennsylvania and West Virginia, and I would like to submit for the record as an addendum to this report a copy of a Mellon Institute Special Report on An Evaluation of Mine Sealing, by Dr. S. A. Braley, February, 1962.

MR. STEIN: That will appear as an addendum. Do you want that to appear in the full transcript or not?

MR. HALL: It is a document readily available.

MR. STEIN: All right. It will be noted as an addendum.

MR. HALL: Thank you.

(The report referred to may be found in the files of the Department.)

MR. STEIN: Are there any comments or questions?

DR. WILBAR: May I ask, Mr. Hall, in your opinion would the backfilling of strip mines which have not been backfilled, or poorly backfilled, and draining acids, not help in reducing and perhaps eliminating the acid discharges from those abandoned mines?

MR. HALL: Well, certainly we feel that proper reclamation is a considerable aid in preventing water pollution from strip mining.

We have done some experimentation in this general area. Some of it looks favorable, and some not quite as favorable as we would like to see it, but certainly this is an effort worth trying.

MR. STEIN: Mr. Hall, I would like to get along, but I think I have to be constrained at this point to note that the argument against Federal enforcement has been made by your association in almost these terms to the Congress many, many times since 1948. I don't think it has dissuaded them in the enactment of the legislation.

I also am a little curious, since you think the proper agency to handle this on the Federal level is the Department of the Interior, Bureau of Mines, which is a mine agency, and yet certainly the interstate agency to handle this is ORSANCO, and that is a water pollution control agency. It seems to me passingly strange that if the interstate water pollution control agency on the interstate level is concerned with this, that it might not be appropriate for the Federal water pollution control agencies to think about it.

MR. HALL: May I answer that, sir?

MR. STEIN: Certainly.

MR. HALL: I might remind you, sir, that I know of no interstate mining agency which is in existence.

MR. STEIN: That is right.

MR. HALL: Therefore, there is no comparable interstate agency to be concerned with it.

MR. STEIN: Are there any further comments or questions?

(No response.)

MR. STEIN: There being no further questions, thank you very much.

(Applause.)

MR. STEIN: Dr. Wilbar?

DR. WILBAR: Thank you, Mr. Hall.

The next person representing Pennsylvania Local Government Associations is Mr. John E. Costello, Esq., Chairman of the Resolutions Committee of the Pennsylvania Municipal Authorities Association, 418 Washington Avenue, Charleroi.

Mr. Costello.

STATEMENT OF JOHN E. COSTELLO, ESQ., ON BEHALF OF THE PENNSYLVANIA MUNICIPAL AUTHORITIES ASSOCIATION

MR. COSTELLO: Dr. Wilbar, Mr. Stein, ladies and gentlemen:

I am here today speaking for the following Pennsylvania local government associations: League of Cities, State Association of Boroughs, Municipal Authorities Association, State Association of Township Supervisors, and State Association of Township Commissioners, each of which is an organization composed of municipal bodies and each of which has as its primary purpose the improvement of local government and local services. We would like to emphasize at the outset that we believe in local government and that we believe in local responsibility.

However, we recognize that many local problems are of such a nature and are so interlocked with those of government at the State and Federal level that they cannot be satisfactorily solved by local resources. Because we believe in local self-government does not mean that we do not recognize the necessity and advantage of cooperation among governmental agencies. This is best evidenced by the fact that I am speaking here for five separate organizations of local government people, each of which has its own problems and its own point of view and among which, in certain areas not including this one, there may be disagreement.

We in local Pennsylvania government consider the control of water pollution a partnership between the Federal, State and local governments because we recognize the vital importance of clean streams. We know that they are necessary for our nation's health as well as to provide better recreational areas for our communities. We know these things are essential to a growing community that has the expectation of vitality and wants to hold forth the opportunity for better living for all of its people. We recognize the physical fact that rivers flow from community to community and from State to State. We recognize the right of the Federal Government to abate pollution when it crosses State lines. We also recognize that the Monongahela has been the scene of a unique demonstration of cooperation and democracy in action between ORSANCO and the affected groups.

We also contend that our Pennsylvania local governments have responded to the challenges set forth by the Pennsylvania Clean Streams Program. The heroic efforts of our communities in providing adequate waste treatment plant facilities is a matter of public record. We led the nation in sewage treatment plant construction last year. Locally, let me point out that the local governments in the Monongahela Valley have expended $44.1 million on the construction of sewage treatment plants since 1937. I have attached hereto, as Exhibit I, a list of the various communities in the Monongahela Valley with their expenditures. These communities vary in size from the very small borough with a population of 1,800 to the Allegheny County Sanitary Authority, which serves more than a million and a quarter persons.

This is not to say that the work has been completed. Every agency of local government recognizes that, while we have accomplished much, there remains much more to do in our area. Based on the best available information from the Commonwealth on the sewage treatment needs in the Monongahela Basin to the year 1970 and including new plants, replacements or additions, interceptors, pump stations, etc., it appears that roughly $18.6 million will be needed to do the job. In the light of the nearly $45 million already spent, it would appear that approximately 75 percent of the job has been done. To illustrate the remaining needs, I have attached Exhibit II, which lists, by county, the communities which

J. E. Costello

will need additional or new sewage treatment services, together with the estimated costs of satisfying their needs. In this area, the Pennsylvania Sanitary Water Board has exercised its influence and the weight of its authority to insure local government cooperation, and, as recently as November 19, 1963, issued an order requiring construction of treatment facilities by an additional twenty Monongahela Valley communities.

As a matter of fact -- and this is not in my presentation -- yesterday a hearing was held here for another twenty-odd communities.

Because of the diligent efforts of the local government people at this time, sewage from two-thirds of this sewered population along the Monongahela River is being properly treated.

The level of progress seems to us to be one of which we can be exceedingly proud for it represents much sacrifice on the part of the people of the communities which we serve. As an example, the Boroughs of Belle Vernon and North Belle Vernon have a combined population of 5,085 people that would be serviced by a sewage treatment plant. The estimated cost exceeds $1 million. There is, therefore, a per capita cost in excess of $200 per person. The Borough of Charleroi and its immediate vicinity has a population of approximately 10,000 people and the estimated cost of serving this community is approximately $1 million.

The Monongahela Valley area has been classified as a depressed area and you should be aware of the exceptionally heavy burden placed upon our people due to the dislocation of heavy industry in the area. More and more of the burden of meeting the payments for sewage treatment is falling on the small, and sometimes jobless, homeowner, due to the removal of industry and/or the reduction of its facilities. The financial burden cannot be met on a local level exclusively. The need for assistance varies from community to community. Many of our local governments serve a population which has a particularly low income, either by virtue of the age of its inhabitants, reflected by the age of the community, of course, or because of the loss of its industrial operation. Assessed values vary from community to community. The borrowing power varies widely and very few local governments can finance these expensive projects without using special financial devices. The projects are, in the main, revenue projects and so must be self-sustaining. In many cases, the cost of the project is so high to be spread among so few with a relatively low ability to pay, that some other source of money must be found to supplement that borrowed on the strength of anticipated revenues. I am saying, therefore, that many of these projects cannot be completed without Federal assistance. Without it, the cost of the service will be beyond the ability of the user to pay. We accept Federal grants such as have come to some few communities in our area under Public Law 660 and the Accelerated Public Works Program. This we do not figure as Federal largesse, but as the Federal share in our partnership designed to protect one of our greatest national resources -- water.

Rounding out this partnership, we have the Commonwealth of Pennsylvania and a law which provides for the payment of a sum up to 2 percent a year of the cost of construction of sewage treatment facilities. Last year our General Assembly appropriated sufficient monies to pay the full 2 percent amount to each of the municipalities which had provided for sewage treatment. This was significant because it was the first time in fifteen years that they approved the full amount. We trust that policy will be continued.

In closing, we at the local level do not believe that there is any need for the Federal Government to take any enforcement action in the Monongahela Valley. We sincerely believe that the present partnership is doing the job and will continue to do so because top priority has already been given to the construction of proper sewage treatment facilities.

Frankly, we are fearful of any extension of Federal control and we believe that pure water, if purchased at the price of the loss of local government and self-determination, would be too dearly bought.

(The exhibits referred to in Mr. Costello's statement are as follows:)

EXHIBIT I

SEWERAGE CONSTRUCTION SINCE 1937
(Sewerage Treatment Only)

Allegheny County

Allegheny County Sanitary Authority	$27,233,899
Municipal Authority of the Borough of Bethel	1,779,408
Elizabeth Borough Municipal Authority	407,413
Sanitary Authority of Elizabeth Township	367,407
Liberty Borough Sewer Authority	92,918
Municipal Authority of the City of McKeesport	5,370,204
Borough of Monroeville	237,000
Township of Penn Hills (Gascola)	808,636
Township of Penn Hills (Long Road)	619,178
Township of Penn Hills (North Bessemer)	23,382
Pleasant Hills Authority	1,447,923
Versailles Borough Authority	81,322
Borough of West Mifflin (New England)	323,129
Borough of West Mifflin (Thompson Run)	1,342,719

Fayette County

Connellsville Municipal Authority	571,422
Municipal Authority of the Borough of Perryopolis	152,104
Borough of South Connellsville	125,745
City of Uniontown	424,914

Greene County

Borough of Waynesburg	290,464

Somerset County

Borough of Somerset	527,747

Washington County

Peters Township	92,246

Westmoreland County

Franklin Township	106,428
Hempfield Township Municipal Authority (E. Stonevilla)	326,226
Hempfield Township Municipal Authority (Carbon Area)	139,884
Hempfield Township Municipal Authority (New Stanton)	52,914
City of Jeannette Municipal Authority	879,588
Penn Township	51,549
Penn Township Sewer Authority	185,319
Total	$44,061,088

EXHIBIT II

ESTIMATED SEWERAGE TREATMENT NEEDS TO 1970
IN THE MONONGAHELA BASIN

(Includes new plants, replacements or additions, interceptors, pump stations, etc.)

Municipality		Estimated cost
Allegheny County		
1.	Allegheny County Sanitary Authority	$5,000,000 (1)
2.	Dravosburg (2)	449,080
3.	Jefferson Borough	498,000
4.	West Elizabeth	107,120
5.	West Mifflin	1,150,000
Fayette County		
6.	Belle Vernon (2) (includes North Belle Vernon and Rostraver Township)	1,057,000
7.	Brownsville	384,190
8.	Brownsville Township	81,500
9.	Dawson	70,040
10.	Dunbar	72,000
11.	Fayette City	117,000
12.	North Union Township	716,000
13.	Point Marion	153,470
14.	Vanderbilt	148,320
15.	Ohiopyle	28,700
16.	Washington Township	360,000
Greene County		
17.	Carmichaels	120,000
18.	Clarksville	33,300
19.	Greensboro	70,040
20.	Jefferson Boro	44,000
21.	Jefferson Township	15,500
22.	Rice's Landing	69,200

(1) Estimated portion of future needs applicable to Monongahela Basin

(2) Has accepted Federal Grant but construction has not started.

EXHIBIT II
(continued)

Municipality	Estimated cost
Somerset County	
23. Berlin	$ 33,000
24. Confluence	83,450
25. Meyersdale	66,000
26. Salisbury	68,500
27. Ursina	31,300
Washington County	
28. Allenport	59,000
29. Bentleyville	190,000
30. California	360,000
31. Centerville	300,000
32. Charleroi	512,940
33. Coal Center	41,000
34. Cokeburg	83,000
35. Donora	558,260
36. Dunlevy	53,560
37. Elco	51,900
38. Ellsworth	86,000
39. East Bethlehem Township	150,000
40. Finleyville	250,000
41. Marianna	65,000
42. Monongahela	417,150
43. New Eagle	213,210
44. North Charleroi	14,500
45. Roscoe	78,500
46. Speers	88,000
47. Stockdale	49,000
48. West Brownsville	115,000
Westmoreland County	
49. Irwin	503,000
50. Monessen	806,490
51. Mt. Pleasant	500,000
52. North Huntingdon Township	1,592,000
53. Smithton	64,890
54. West Newton	153,470
55. Youngwood	222,480
Total	$18,605,060

MR. STEIN: Thank you, Mr. Costello.

(Applause.)

MR. STEIN: Mr. Costello, would you want to wait and see if there are any questions?

MR. COSTELLO: Surely.

MR. STEIN: Without objection, your exhibits will appear in the record as read.

MR. COSTELLO: Thank you.

MR. STEIN: Are there any comments or questions?

(No response.)

MR. STEIN: Dr. Wilbar?

DR. WILBAR: Thank you, Mr. Costello.

The next person to appear is one representing the Pennsylvania Section of the American Water Works Association, Mr. F. R. Perrin, Chief Chemist, South Pittsburgh Water Company, Pittsburgh.

Mr. Perrin.

STATEMENT OF F. R. PERRIN, CHIEF CHEMIST, SOUTH PITTSBURGH WATER COMPANY, ON BEHALF OF THE PENNSYLVANIA SECTION OF THE AMERICAN WATER WORKS ASSOCIATION

MR. PERRIN: Mr. Chairman, honored guests, ladies and gentlemen:

I am grateful for the opportunity to appear before you, representing the Pennsylvania Section of the American Water Works Association.

The problem of Monongahela River pollution is one with which I am most familiar. During the past 39 years I have served as Chemist or Superintendent of Purification of Public Water Supply Treatment Plants, handling Monongahela River water in the Pittsburgh area.

During this period, we have progressed from a lack of any pollution control on the Monongahela River to one of close control of discharges that, for purposes of public water supply, adversely affect the quality of the water. As a result of this, the quality of the river water today is far better than the quality 39 years ago. However, there still remains the necessity for continued improvement.

Our progress to date is a tribute to the leadership, cooperation and diligent work of the Pennsylvania Department of Health, as well as to the cooperation of the local industries and municipalities.

In addition, I must also emphasize that we have received excellent assistance from the Ohio River Sanitation Commission and the United States Public Health Service. These two organizations have been most cooperative in attacking this problem.

As I see it, the principal problem at present is the high acidity of the river water, caused primarily by mine drainage. At times, also the presence of organic chemicals is a cause of concern.

The improvement we have already attained has taxed our technological skills to the utmost and further reduction of acid mine drainage and organic chemical pollution certainly will require additional research. I heartily concur with the statement of Dr. Charles Wilbar, Secretary of Health of Pennsylvania. The Federal Government should play an important role in research to determine new and better methods to reduce mine drainage and organic chemical pollution. The Federal Government could also be of material assistance in alleviating pollution entering the Monongahela River from other States.

Thank you.

MR. STEIN: Thank you, Mr. Perrin.

(Applause.)

MR. STEIN: Would you wait just a minute, Mr. Perrin?

Are there any comments or questions?

(No response.)

MR. STEIN: I just have one, Mr. Perrin.

MR. PERRIN: Surely.

MR. STEIN: I was interested in your comment, where you indicated that from a standpoint of a water works operator, the present problem you had in the river was the high acidity.

I assume that you were in the hall -- no pun intended -- when Mr. Hall made his remarks that the fact was that the acidity discharged in the Monongahela Valley had not proved detrimental to municipal water works.

Do you care to comment on this, or is there some reconciliation?

MR. PERRIN: That is pretty hard to comment on. Certainly, natural water, in my opinion --

MR. STEIN: We are not just talking about natural water.

MR. PERRIN: Now, just a moment. Natural waters, in my opinion, would be a whole lot easier to handle and far less expensive for a public water supply than the type of water we have to contend with in the Monongahela.

MR. STEIN: Thank you very much.

Are there any other comments or questions?

(No response.)

MR. STEIN: Dr. Wilbar?

DR. WILBAR: Thank you, Mr. Perrin.

Next is the representative of the Pennsylvania Federation of Sportsmen's Clubs, Mr. Russell J. Blair, past President, Southwest Division, Pennsylvania Federation of Sportsmen's Clubs, East Independence Street, Perryopolis.

MR. LAUDADIO: There is a slight switch here in presenting this for the Federation.

DR. WILBAR: This is the Honorable John Laudadio, Representative from the Pennsylvania Legislature from Westmoreland County.

STATEMENT OF HONORABLE JOHN LAUDADIO, MEMBER OF THE HOUSE OF REPRESENTATIVES, COMMONWEALTH OF PENNSYLVANIA, ON BEHALF OF THE PENNSYLVANIA FEDERATION OF SPORTSMEN'S CLUBS

MR. LAUDADIO: We want to take this opportunity to thank you for the privilege of presenting conservation's views at this conference.

The Pennsylvania Federation of Sportsmen's Clubs is made up of approximately 200,000 conservationists throughout the State and is a nonprofit organization dedicated to preserving our natural resources in Pennsylvania and the nation.

Land and water are the vital resources of humanity. Since we are dealing with water at this conference, it is our desire to point out where we have been and just what direction we are now going.

Pennsylvania can no longer enjoy the luxury of cleaning up by postponement. The hour is late and every day from now on will be vital.

The rivers know no boundaries. They flow from city to city and from State to State until they reach the ocean.

When the watershed is polluted and this pollution flows from one State to another, it no longer is a problem for one State alone. It becomes a national problem and should be dealt with nationally.

The sludge bombs from open sewers and mine acid that are now polluting our waters are a tragedy in modern America. We can conquer space and there is no reason to believe that we cannot overcome this problem of pollution as well.

We don't agree with the people who sit on their hands gloomily declaring that this problem has been with us so long that it will be with us forever and ever.

We would still be back in the stone age if all of us had that attitude and were willing to believe this.

We in the Federation think it is now time to stop blaming the other fellow.

It is time to admit our own shortcomings and to begin lifting ourselves by our bootstraps and get the job done.

The road ahead to clean, pure water is naturally rough and costly. But if we all will pull together -- the local communities, the States, and the national government, along with business and industry -- we can and will attain the goals we seek.

We believe it is now time to stop talking so much about mine drainage research. We believe it is now time to start applying practical means of abating mine acid pollution which are now available. More research without application can only delay the cleanup program which is imperative now and not in the year 2000.

The water we use and enjoy is the lifeblood of our nation and the fight to save it from pollution rests on the shoulders of us all.

In closing, the Pennsylvania Federation of Sportsmen's Clubs believes that all citizens must now realize the most realistic memorials are parks, recreation areas, and, above all, pure water. We urge a complete and united effort by all concerned to bring this program to a successful conclusion.

I want to thank the organization, the State of Pennsylvania and everyone at this conference for the privilege of allowing me to say a few words on our position on conservation.

I want to say that I was happy to hear the gentleman who was representing the municipalities. He was accurate when he made the statement that Pennsylvania, in this legislative year, finally, after fifteen years, has met its obligation by making available the absolute 2 percent for the municipalities in their clean-stream program and sewerage control program. This is the first year, and it took a lot of doing with the budget here in Pennsylvania.

As a member of the House of Representatives, I can recall the discussions and debate which took place at Harrisburg, and I think all of us can be happy and can look forward to a continuation of the complete 2 percent for all municipalities in helping in our clean-up program.

Thank you.

(Applause.)

MR. STEIN: Thank you very much.

Are there any comments or questions?

MR. YOST: I have one question I would like to ask this gentleman.

MR. STEIN: Surely.

MR. YOST: I understand, of course, that you presented this paper on behalf of the Sportsmen's Clubs. Do you endorse the recommendations personally that are contained in this report?

MR. LAUDADIO: Yes, sir. I am the legislative representative also of the Pennsylvania Federation of Sportsmen's Clubs. I handle their legislative program at Harrisburg.

MR. YOST: I would ask you one question then: If I understand you correctly, the Sportsmen's Association advocates the introduction or application of means that have some indication of success, and that research not be continued, or what? In other words, are you advocating the expenditure of monies on methods that have not been proven to be satisfactory?

MR. LAUDADIO: We are saying, in effect, that we have talked research for the last twenty-five years, and we have accomplished a lot through research.

However, we are saying now, with all the money spent on research, let's make some practical applications of the things that we found from these research programs. We have talked more about actually research, and we have spent a lot of money on research. We haven't put a lot of the things we found from research to practical application.

MR. YOST: Then it is your understanding or opinion that the research that has been done in the past has come up with conclusive evidence as to the means of abating mine drainage?

MR. LAUDADIO: Definitely so. We have many, many instances in Pennsylvania where we have reclaimed complete streams under our sealing program, and we have many instances where we have done complete backfilling of strip mining, which is the result of some research over the past twenty-five years. We have found many applications from research that have been very successful.

MR. YOST: Thank you.

MR. STEIN: Are there any other comments?

(No response.)

MR. STEIN: Mr. Representative, I would like to call your attention again to Mr. Hall's statement, where he talks about this acid mine drainage, and talks about a program for research. He says it is logical that the Federal Government should assist the State through coordinated research, grants-in-aid to the States for research and demonstration, and grants to the States for large-scale application of the control methods developed by research, which seems to be a well developed research program.

Then he goes on to say:

> "The research program is principally involved with soil, mining, etc., rather than matters of health. Because of the disciplines involved with this program and because special knowledge and skills in these disciplines is principally available in the Department of the Interior, the principal Federal responsibility for conducting and cooperating in these programs should be

vested in this department...."

Now, we all know and respect the Bureau of Mines, which has an excellent research program. Do you associate with this statement, or do you think that the water pollution control agencies on the Federal, interstate or State levels should be concerned with cleaning this up and going beyond research at this time?

MR. LAUDADIO: Well, you have read a lot and asked a long question.

MR. STEIN: Yes.

MR. LAUDADIO: I would say that here again I believe you are talking about two different Federal agencies, and I would --

MR. STEIN: No. I am talking about whether you think , in order to simplify this, that we should, on the Federal level and on the other levels, confine ourselves to a research program now, or whether we should have an abatement program.

MR. LAUDADIO: Absolutely not.

MR. STEIN: What do you think?

MR. LAUDADIO: I think that we should look to your Department for as much help in abatement of pollution in Pennsylvania and in the neighboring States as we can possibly get.

MR. STEIN: I think this is a straight question of Federal authority. There is no doubt that the Bureau of Mines is an excellent Bureau, but I think in this field their program is largely one dealing with research, and they have done an excellent job of research.

But the question here is whether you think the role of the Federal Government should continue to be solely one of research, or whether we also should have an abatement program?

MR. LAUDADIO: I again must say that we want as much help from your Department as possible, because we have talked about pollution crossing State lines, and here again Pennsylvania can't deal effectively with water crossing in from our neighboring State. Also there is the fact that it goes from our State down to the neighboring State, and as a result we need all the help we can get from HEW.

MR. STEIN: Thank you.

Are there any other comments or questions?

(No response.)

MR. STEIN: If not, thank you very much.

(Applause.)

MR. STEIN: Dr. Wilbar.

DR. WILBAR: The last representative from Pennsylvania today is a person representing the Izaak Walton

League, Dr. Fred C. Perkins, President of the Izaak Walton League, 93 Morgantown Street, Uniontown, Pennsylvania. Dr. Perkins.

STATEMENT OF DR. FRED C. PERKINS, PRESIDENT, PENNSYLVANIA DIVISION, IZAAK WALTON LEAGUE OF AMERICA, INC.

DR. PERKINS: Dr. Wilbar and conferees:

It is a pleasure for me to attend this conference. I am very glad to be here.

I represent the Izaak Walton League of Pennsylvania as President.

Ideally, all water should be fit for direct human use -- drinking, swimming, esthetic enjoyment -- without special treatment, and it will then also be eminently suited for municipal, agricultural and industrial utilization.

The public interest requires that man shall not act to pollute his environment so that it is rendered unfit for his direct use or esthetic enjoyment, or so to pollute the environment of fish, wildlife, and other organisms that they are destroyed in substantial numbers over large or small areas.

F. C. Perkins

The public goal should be maximum removal of pollutants from all streams, rather than use of streams to carry an "acceptable maximum" load of wastes.

Since water courses know no political boundaries, pollution control is rightfully a Federal as well as a local, State and interstate responsibility. Although control measures should be initiated at the lowest effective level, the Federal Government should have clear authority to strongly enforce pollution abatement and prevention in cases when lower authority proves ineffectual or inadequate.

It is the clear responsibility of every municipality to provide adequate treatment of its sewage.

It is the duty of every industrial concern to treat its wastes, and it is the responsibility of industry -- not government -- to discover methods of treating its wastes. The costs of pollution research and treatment methods should be given to industry, but it should be borne in mind that there is no disposal problem, in this age of science, incapable of satisfactory solution.

The Pennsylvania Division of the Izaak Walton League of America feels that tremendous progress has been made in pollution abatement in the waters of Pennsylvania, but much still remains to be done. With the continued efforts of the Pennsylvania Department of Health with its planning and enforcement, the ultimate goal of the Izaak Walton League of America for clean water will be reached, but the United States Department of Health, Education, and Welfare must step in the gap when the States fail to clean up.

Thank you.

MR. STEIN: Thank you, sir.

Are there any comments or questions?

(No response.)

MR. STEIN: If not, thank you very much.

DR. PERKINS: Thank you for letting me be here.

(Applause.)

MR. STEIN: Dr. Wilbar?

DR. WILBAR: Thank you, Dr. Perkins.

Mr. Chairman, this is all that Pennsylvania has to present today. Tomorrow, after the end of all the more formal reports, there may be other organizations from various places who may have some reports to present, and I think there will be, but not today.

MR. STEIN: Thank you very much, Dr. Wilbar, for certainly a comprehensive and complete coverage of the program from Pennsylvania, its representatives and invitees.

After consultation with the West Virginia representatives and in the interest of time, we are going to push right on until we finish the West Virginia presentation tonight. With that, we will call on Mr. Bern Wright of West Virginia.

Mr. Wright.

STATEMENT OF BERN WRIGHT, CONFEREE, WATER RESOURCES DIVISION, STATE DEPARTMENT OF NATURAL RESOURCES, STATE OF WEST VIRGINIA

MR. WRIGHT: Mr. Chairman, conferees, ladies and gentlemen:

I have provided the reporter with a copy of this. There are certain charts and tables that I will not discuss at this time. I will, however, request that they be incorporated in the record for inclusion in the conference document.

MR. STEIN: Mr. Wright, this entire report will appear in the conference transcript as read, unless you give any indication where you want to deviate from it. Thank you.

MR. WRIGHT: Thank you.

INTRODUCTION

B. Wright

The Division of Water Resources of the Department of Natural Resources and the State Water Resources Board are charged with the administration and enforcement of all laws relating to slack water dams, stream and water areas beautification, and the conservation, development, protection, enjoyment and use of the water resources of the State. Water resources is defined by law as "any and all water on or beneath the surface of the ground, including natural or artificial watercourses, lakes, ponds or diffused water on the surface of the ground, and water percolating, standing or flowing beneath the surface of the ground. The Board is charged with making surveys and investigations of the water resources of the State and is directed by law to investigate and study the problems of agriculture, industry, conservation, health, stream pollution, domestic and commercial uses and allied matters as they relate to the State's water resources. The Board is directed by law to make and formulate comprehensive plans and recommendations for the further development, improvement, protection, preservation, regulation and use of the water resources of the State.

The Board is given authority to conduct research, investigations and scientific experiments in cooperation with the College of Engineering at West Virginia University to discover economical and practical methods for elimination, disposal and treatment of industrial wastes and the control and correction of stream pollution, and in this connection may, on behalf of the State, receive money from any public or private agency.

In addition the Board also has the power and authority to perform the following duties: (1) To enter into compacts and agreements concerning West Virginia's share of interstate waters; (2) To cooperate with other State, Federal and interstate agencies in the conservation, improvement and development of water resources; (3) To conduct or contract for the conducting of scientific investigations, experiments and research and to collect data concerning pollution and water resources; (4) To enter at any reasonable time upon any land public or private for the purpose of making surveys, examinations, investigations, and studies concerning water resources or pollution; (5) To hold public hearings pursuant to the rules and regulations established by the Board; and (6) To advise all users of water resources as to the availability of water resources and the most practicable method of water diversion, use, development and conservation.

Plans and specifications for the construction of slack water dams and other works in connection with the construction of public roads rests with the director of the department in cooperation with the State Road Commissioner.

The director of the department shall have the supervision, care and control of all dams, reservoirs, ponds, water parks, basins, lakes or other incidental works constructed in connection with the construction of public roads.

The Division of Water Resources is responsible for the husbandry of rivers, streams, creeks, lakes and ponds except farm ponds and other water areas and the lands immediately adjacent to farm ponds. The chief of the Division is given responsibility for the conservation, beautification, improvement and use of all such water areas of the State. The Department's Law Enforcement Division, however, is responsible for enforcing the provisions of the law prohibiting disposal of litter in, along, and near such water areas.

ORGANIZATION

By an act of the 1961 legislature, the State Water Resources Commission was abolished on June 30, 1961, and became the Division of Water Resources in the newly formed Department of Natural Resources. The former seven-member Commission was redesignated the Water Resources Board with the director of the Department of Natural Resources serving as Chairman of the Board and the chief of the Division as Executive Secretary of the Board. In addition to the chief and the assistant chief, the Division is organized into three planning sections and two service sections. The Water Resources Section is charged with the planning and development of watershed areas, water quality monitoring, stream surveys and the collection of hydrologic data. The Municipal Waste Section and the Industrial Waste Section are charged with the planning of municipal and industrial waste congrol programs. Although the Laboratory Section is primarily a technical service section for the analysis of samples, the two chemists are sometimes called upon to conduct surveys, investigations and other work. The remaining section is clerical. Due to the small number of people on the staff, any person may be called upon to aid another in a major problem regardless of his primary duties.

The State Water Resources Board functions as a quasi-judicial and policy-making body within the Division of Water Resources. The Board is composed of three ex-officio members who heads of State departments and four members appointed by the governor.

Table 1 shows the expenditures of the Division for the fiscal year 1963. Removing the contribution of $32,500 to the U.S. Geological Survey from the Current Expenses as shown in Table I, leaves a balance of $144,721 for operating expenses.

(Table I is as follows:)

Table I

Expenditures for Fiscal Year 1963

Personnel*			$ 92,104
Supervision	(1)	$ 9,300	
Technical Services	(12)	54,796	
Clerical Services	(3)	8,272	
Janitor - Messenger	(1)	3,360	
Part-time Employees	(4)	2,413	
Extra Help **		13,963	
Current Expenses			$ 84,233
Repairs & Alterations			1,452
Equipment			9,432
TOTAL OPERATING EXPENSES			$ 187,221
Contributory Funds			19,460
U. S. Geological Survey ***		(32,500)	
Ohio River Valley Water Sanitation Commission		15,860	
Interstate Commission on the Potomac River Basin		3,600	
TOTAL EXPENDITURES			$ 206,681

* Figures in parentheses refer to number of persons in each category.

** Salaries paid to Department of Natural Resources field personnel not connected with the Water Resources Division, but paid from Water Resources General Revenue fund.

*** U. S. Geological Survey paid from Current Expenses and is not included as Special Contributory Funds.

B. Wright

The numbers in parentheses in Table I refer to the number of persons paid in each category and does not indicate the present size of the staff.

At the present time, in addition to the chief of the Division and the assistant chief, the staff of the Water Resources Division consists of the following personnel:

In the Municipal Waste Section:

- Section Head - Engineer II (Vacant)
- Inspector II (Vacant)

In the Industrial Waste Section:

- Section Head - Engineer III
- Engineer I (Vacant)
- Chemist III
- Inspector III
- Inspector II
- Inspector II (works part-time in Water Resources Section)

In the Water Resources Section:

- Section Head - Engineer II
- Inspector III (works part-time as laboratory assistant)

In the Laboratory Section:

- Section Head - Chemist IV
- Chemist II

B. Wright

In the Clerical Section:

Clerk IV

Stenographer I

Clerk II

Extra Help and Part-Time Employees:

Janitor

Public Relations Representative

OBTAINING COMPLIANCE WITH THE LAW

Article 5, Chapter 20 of the Code of West Virginia deals with the Division of Water Resources, its duties and functions. Pollution is defined by law as meaning the discharge or deposit either directly or indirectly of any waste or other substance in such a condition, manner or quantity as may contaminate or alter the physical, chemical or biological properties of any of the waters of the State to such an extent that the water is rendered detrimental to the public health or made unsuitable for any legitimate use.

The law states that any person, company, municipality or other agency causing a material contribution of polluting substances to the waters of the State shall file with the Board any information that the Board may require for the performance of its duties. The law also states that no person shall without first securing a permit from the Board, construct or operate any sewer or treatment works or modify the load from any existing outlet which would cause a material pollution of the waters of the State. The Board may issue temporary or conditional permits and may renew, change, modify or revoke previously issued permits. The Board may also deny a permit if such denial appears to be justified. However, any person having a permit denied or revoked may appeal such action of the Board.

Any person causing the pollution of any water may be cited by the Board to a hearing to show cause why an order should not be issued regulating such pollution. Any person upon whom such final order is issued shall have 30 days after the receipt of the order to take steps to comply with the order. However, the person against whom such order is issued shall, before proceeding to install any treatment system, submit to the Board for its approval the plan which will be followed in order to abate pollution.

Any person who operates a sewer without a permit or who fails to obey a final order of the Board is subject to the penalties provided by law.

POLICIES OF THE BOARD

B. Wright

The State Water Resources Board has set no effluent standards. Minimum water quality objectives have been established and are available upon request from the Division of Water Resources. A copy of these objectives are attached as Appendix One. The Board first seeks to obtain compliance with the law through voluntary action rather than to resort to time-consuming hearings. Each case is examined upon its own merits and since the program is a cooperative one, no rigid policies have been set regarding how pollution abatement is to be accomplished. The Division staff does attempt, however, to direct the planning of disposal systems along the lines which experience at other plants have taught will work. Hearings and the penalties provided by law are resorted to only in cases where cooperative efforts fail.

MUNICIPAL WASTE ABATEMENT PROGRAM

In the municipal program the Board has proceeded first with the larger cities and with those smaller cities having aggravated pollution problems. Since most of the larger cities now have active pollution abatement programs underway and with the impetus provided by Public Law 660 and the Accelerated Public Works Act, greater emphasis is being placed upon the programs of the smaller municipalities. The formation of public service districts are encouraged wherever possible to serve unincorporated areas of concentrated population.

Plans for municipal sewage treatment are approved by the State Department of Health, based upon the degree of treatment specified by the State Water Resources Division. After approval by the Health Department, the Water Resources Division then issues a permit for the installation. Sewage disposal systems from individual homes and small business places including slaughterhouses, dairies and canneries are sometimes approved by the Health Department without further action by the Water Resources Division unless a confirming permit is requested. Rate schedules established by municipal sanitary authorities must be approved by the Public Service Commission.

Not only is the municipal program geared solidly to the Federal grants under Public Law 660 but with the passage of the Accelerated Public Works program, it is completely unrealistic to attempt to enforce abatement of pollution by municipalities without Federal monetary aid from one or both of these sources.

Table II shows the current status of municipalities in the Monongahela River Basin in West Virginia.

In the years immediately following World War II the

B. Wright

State Water Commission zoned, according to the degree of pollution found, all the streams in West Virginia, except in the Ohio and Monongahela Basins. (These streams were not zoned due to changes in personnel who preferred Minimum Water Quality Objectives to stream zoning.) Cities and industries were given priorities for sewage treatment in the streams so zoned. In the case of the Ohio River, which was not zoned stream standards were established by ORSANCO and the cities in West Virginia were notified of their obligations on the Ohio River. In the case of the Monongahela River and certain of its tributaries the towns were told in the early 1950's that the Commission intended to go slow until further information could be obtained regarding the effect of acid stream conditions on sewage bacteria.

However, after the ORSANCO study on the Monongahela River was published in 1959, West Virginia notified all cities on the main stems of the Monongahela and West Fork Rivers that sewage treatment would be required in spite of the acid conditions in the streams. This is shown in Table II. Progress that has been made to date is also shown in Table II.

(Table II is as follows:)

Table II
Status of Municipal Waste Treatment
Monongahela Basin

Town	Stream	Degree of Treatment Given or Required	Estimated Sewered Population	1960 Census Pop.	Current Status	Grant Requested (P)=PL 660 (A)=APW	Grant Received (P)=PL 660 (A)=APW	Remarks
Belington	Will Run of Tygart R.	Primary	1,517	1,528	No Action			
Bridgeport	Simpson Cr. of West Fork River	Primary	1,581	4,199	Under Discussion			
Buckhannon	Buckhannon River	S & Cl	6,500	6,386	Adequate Treatment		250,000(P)	Project completed, under order
Carolina (Uninc.)		S & Cl	1,000	700	Adequate Treatment			
***Clarksburg**	West Fork River	S & Cl	20,000	27,500	Final Plans Approved			Under order. Under court injunction
Dally-Valley Bend (uninc.)		Primary	800	1,200	Inadequate Treatment			
Elkins	Tygart R.	S & Cl	8,135	8,307	Adequate Treatment		250,000(P)	Project completed, under order
Fairmont	Monongahela River	Primary	25,000	27,200	Prelim. Plans Approved	1,910,000(A)		Notified 5-59
Fairview	Paw Paw Cr. of Monon. River	S & Cl	831	653	Final Planning	109,718(P)(A)		
Farmington	Buffalo Cr. of Monon.R.	S & Cl	880	709	Final Planning	82,500(A)		

Table II (Cont'd.)

Town	Stream	Degree of Treatment Given or Required	Estimated Sewered Population	1960 Census Pop.	Current Status	Grant Requested (P)=PL 660 (A)=APW	Grant Received (P)=PL 660 (A)=APW	Remarks
Grafton	Tygart R.	P & Cl	7,431	5,791	Prelim. Plans Complete	650,000(A)		
Grant Town	Paw Paw Cr. of Monon.R.	Primary	2,051	1,105	Prelim. Plans	213,154(A)		
Granville		Primary	806	806	Under Discussion			
Harman	Dry Fork of Cheat River	P & Cl	NCS	128	No action			
Idamay (Uninc.)		S & Cl	1,000	800	Adequate Treatment			
Hopemont Sanitarium	Snowy Cr. of Yough.R.	S & Cl	400		Adequate Treatment			
Jacksons Mill 4-H	West Fork River	Primary	500		Adequate Treatment			
Jane Lew	Hackers Cr. of West Fork R.	P & Cl		426				No community Sewer System
Junior	Tygart R.	Primary	533	552	No action			
Kingwood	Indian Cr. of Cheat River	P & Cl	2,000	2,530	Under Discussion			
Lumberport	Tenmile Cr. of West Fork R.	Primary	1,285	1,031	No action			
Hendricks	Dry Fork & Blackwater R.	P & Cl	NCS	407	No action			

Table II (Cont'd.)

Town	Stream	Degree of Treatment Given or Required	Estimated Sewered Population	1960 Census Pop.	Current Status	Grant Requested (P)=PL 660 (A)=APW	Grant Received (P)=PL 660 (A)=APW	Remarks
Mannington	Buffalo Cr. of Monon.R.	S & Cl	3,155	2,996	Preliminary Plans	442,240(A)		
Masontown	Deckers Cr. of Monon.R.	P & Cl	900	841	No action			
Medium Security Prison Huttonsville	Tygart R.	P & Cl	300		Adequate Treatment			
Mill Creek	Mill Cr. of Tygart R.	P & Cl	732	817	Preliminary Plans			
Monongah	West Fork River	P & Cl	1,300	1,321	Adequate		65,169(P)	Notified 5-59 Project Complete
Morgantown	Monongahela River	Primary	26,000	22,000	Grant Application Pending	2,211,540(A)		Deckers Creek Interceptor built notified 5-59
Newburg	Three Forks Creek to Tygart R.	Primary		494				No Community Sewer System
*Nutter Fort	Elk Creek of West Fork River	S & Cl	2,300	2,440	Under Construction			Will enter Clarksburg system
Parsons	Dry Fork of Cheat River	P & Cl	2,146	1,798	Under Construction		106,500(P)(A)	
Philippi	Tygart R.	P & Cl	2,228	2,228	Adequate Treatment		102,070(P)	Project Completed

Table II (Cont'd.)

Town	Stream	Degree of Treatment Given or Required	Estimated Sewered Population	1960 Census Pop.	Current Status	Grant Requested (P)=PL 660 (A)=APW	Grant Received (P)=PL 660 (A)=APW	Remarks
Reedsville	Deckers Cr. of Monon.R.	P & Cl	324	398	Inadequate Treatment			
Rivesville	Paw Paw Cr. of Monon.R.	Primary	1,552	1,191	Under Construction		70,151(P)	Notified 5-59
Rowlesburg	Cheat River	P & Cl	1,452	970	Final Plans Approved		155,000(P)(A)	Under order
Salem	Tenmile Cr. West Fork	S & Cl	3,000	2,366	Under Construction	127,165(A)	167,380(P)	
Shinnston	West Fork	Primary	2,817	2,724	Preliminary Plans			Notified 5-59
Star City	Monongahela River	Primary	1,175	1,236	Preliminary Plans	77,913(P)		Notified 5-59
State School for Boys Pruntytown		S & Cl	260		No action			
Stonewood*	Elk Creek	Primary	2,202	2,202	Under Construction			Will enter Clarksburg system
Terra Alta	Snowy Creek & Salt Lick Creek	S & Cl	1,471	1,504	No action			
Thomas	North Fork of Blackwater River	P & Cl	1,000	830	Preliminary Plans		85,450(P)	
Tunnelton	Pringle Run of Cheat R.	P & Cl	552	359	No action			

Table II (Cont'd.)

Town	Stream	Degree of Treatment Given or Required	Estimated Sewered Population	1960 Census Pop.	Current Status	Grant Requested (P)=PL 660 (A)=APW	Grant Received (P)=PL 660 (A)=APW	Remarks
Weston*	West Fork River	S & Cl	8,300	8,754	P & Cl		235,009(P)	Under order Primary Plant in operation
Weston State Hospital	West Fork River	S & Cl	3,000		Adequate Treatment			
Westover	Monongahela River	Primary	1,752	4,749	Preliminary Plans			
Worthington	West Fork River	Primary	350	361	Preliminary Plans			Notified 5-59

* Weston and Clarksburg, were told in the early 1950's that Primary treatment with chlorination would be acceptable if the Stonewall Jackson Reservoir is constructed with sufficient low flow augmentation.

P & Cl - Primary & Chlorination

S & Cl - Secondary w/chlorination

NCS - No community sewer system

One stipulation was made in dealing with Clarksburg and Weston. These towns were told that if the Stonewall Jackson Reservoir became a fact and that if low flow augmentation therefrom was sufficient, these towns would satisfy the Commission's requirements by primary treatment plus chlorination. If not, secondary treatment would be required, also with chlorination.

With the situation in regard to the Stonewall Jackson reservoir still unresolved and with no early solution to the problem in sight, the situation at Weston and Clarksburg remains confused as to the degree of treatment to be installed. Weston already has primary treatment plus chlorination but Clarksburg's project appears to have bogged down in a quagmire of financial and possibly other difficulties.

Eighteen out of 47 sewered communities and major institutions in the Monongahela River Basin have applied for Federal aid to assist with financing construction of sewage treatment facilities. Grants received or requested total $7,310,959. Towns or major installations with adequate waste treatment facilities in operation and those having facilities under construction number 16 and serve a sewered population of 43,863. When Clarksburg, Fairmont and Morgantown get moving in earnest, this figure will rise to 114,863 or about 77 percent of the sewered population. Fairmont and Morgantown have applied for Federal grants totaling $4,121,540. These grants have not yet been approved.

MR. STEIN: Pardon me. Have these grants not been approved by the Federal Government or by the State?

MR. WRIGHT: They have been approved by the State but not by the Federal Government.

MR. STEIN: Thank you.

MR. WRIGHT: Continuing on:

INDUSTRIAL WASTE ABATEMENT PROGRAM

Coal Washery Wastes

The Water Resources Division carries out a continuous inspection program of all the coal washing facilities in the Monongahela Basin and throughout the State. Results of the inspections (see Table III) are reviewed at the Division office at Charleston on a weekly basis whenever scheduling permits.

(Table III is as follows:)

Table III

Status of Coal Washery Waste Abatement

In The Monongahela Basin

Company	Location	Receiving Stream	Waste Water Disposal Facilities	Status-Last Inspection*	Emergency Pond	Facilities Status
Badger Coal Company	Meriden	Fords Run	Underground	(U) 71.5%	No	Inadequate
Bethlehem Mines Corp.	Barrackville	Buffalo Creek	Ponds	(S) 100 %		Adequate
Bethlehem Mines Corp.	Century	Big Run	Ponds	(S) 100 %		Adequate
Bethlehem Mines Corp.	Ida May	Helens Run	Ponds	(S) 100 %		Adequate
Chapel Coal Company	Irona	Morgans Run	Ponds	(S) 100 %	Yes	Adequate
Christopher Coal Co.	Maidsville	Monongahela	Impoundment	(S) 100 %		Adequate
Christopher Coal Co.	Granville	Monongahela	Impoundment	(S) 100 %		Adequate
National Coals Inc.		Monongahela	Impoundment	(S) 100 %		Adequate
Bridge Run Coal Company	Buckhannon	Bridge Run	Ponds	(S) 100 %		Adequate
Clinchfield Coal Company	# 2 Dola	Little Ten Mile Creek	Thickener (Closed Circuit)	(S) 100 %	No	Adequate
Clinchfield Coal Company	# 3 Dola	Little Ten Mile Creek	Thickener (Closed Circuit)	(S) 75 %	No	Adequate
Clinchfield Coal Company	# 1 Phillipi	Elk Creek	Impoundment	(S) 100 %	Yes	Adequate
Eastern Associates Coal Corporation	Grant Town	Paw Paw Creek	Impoundment (Thickener)	(N. O.)	Yes	Adequate
Gage Coal Company	Gage	Buffalo Creek	Ponds	(S) 100 %	No	Adequate
Galloway Land Company	Dawmont	West Fork River	Ponds	(S) 100 %	No	Adequate
Hackers Creek Coal Company	Hodgesville	Hackers Creek	Ponds	(S) 100 %	No	Adequate

Table III (cont'd.)

Company	Location	Receiving Stream	Waste Water Disposal Facilities	Status-Last Inspection*	Emergency Pond	Facilities Status
Joanne Coal Company	Rachel	Buffalo Creek		(S) 100 %		Adequate
Kesley Construction Co.	Weston	Stonecoal Creek	Ponds	(N. O.)	No	Adequate
Kray Coal Company	Howesville	Three Forks Creek	Ponds	(S) 100 %	No	Adequate
Mountaineer Coal Company	Fairview	Sugar Run	Impoundment	(S) 100 %	Yes	Adequate
Mountaineer Coal Company	Jordan	Monongahela River	Impoundment	(S) 100 %	No	Adequate
Mountaineer Coal Company	Owings	Mudlick Run	Impoundment	(S) 100 %	No	Adequate
Mountaineer Coal Company	Stringer	Bingamon Creek	Underground Impoundment	(S) 100 %	Yes	Adequate
Mountaineer Coal Company	Farmington	Buffalo Creek	Ponds	(S) 100 %	Yes	Adequate
Pecks Run Coal Company	Hodgesville	Pecks Run	Pond	(S) 100 %	No	Adequate
Petitto Brothers Coal Co.	Lost Creek	Lost Creek	Ponds	(S) 80 %	No	Adequate
Rappert-Fairmont Coal Co.	Buckhannon	Buckhannon River	Ponds	(S) 100 %	Yes	Adequate
Robey Run Coal Company	Dola	Little Ten Mile Creek		(S) 100 %		Adequate
Rochester & Pittsburgh Coal Company	Four States	Tevebaugh Creek		(S) 100 %		Adequate

* Per cent of time plant found to be operating satisfactorily in 1963.

In this way all personnel engaged in related work are kept current on the status of the washeries in question and also are enabled to lend support where needed.

As in all other coal preparation areas of the State the program entails a permit system which is required by law To obtain a permit the company must apply, giving information pertinent to abatement of stream pollution, and then exhibit waste disposal facilities which must meet the approval of a representative of the Water Resources Division.

Serious violation of an operating permit issued by the Water Resources Division usually results in revocation of said permit. A plant operating without a permit is subject to regulation by the Law Enforcement Division. If prosecution is not sufficient to secure abatement of pollution, injunctive relief may be obtained.

The coal washery waste treatment program in the Monongahela Basin has been considered to be ahead of the remainder of the State because of early initiation of a corrective program. Only one coal preparation plant is currently considered to be not meeting State waste treatment requirements and this is due to unsatisfactory operating procedure. At this time there are 185 operating coal preparation installations in West Virginia. Of this number, 31, or approximately one-sixth of the total are located in the Monongahela River Basin. This shows then that about 97 percent of the operating coal washing installations in the Monongahela River Basin have adequate treatment facilities and are operating them in a satisfactory manner. This is also about the State average.

Acid Mine Drainage

There are approximately 496 active mines and an unknown number of abandoned mines in the Monongahela River Basin in West Virginia.

(Table IV is as follows:)

Table IV

Active Mines In The Monongahela Basin*

1962

County	Number of Mines		Production Tons	
	Underground	Surface	Underground	Surface
Barbour	37	12	3,873,211	2,756,260
Harrison	101	25	4,720,037	1,184,048
Lewis	3	7	11,713	152,380
Marion	14	2	9,114,830	24,853
Monongalia	71	8	5,677,130	96,273
Preston	85	18	2,246,214	714,488
Randolph	33	10	735,708	152,419
Taylor	27	3	155,897	300,601
Tucker	2	--	4,100	--
Upshur	34	4	1,079,044	86,862
TOTALS	407	89	27,617,884	5,468,184

* From 1962 Annual Report of the West Virginia Department of Mines.

B. Wright

Each of these mines, active and abandoned, has from one to thirty-five openings from which acid mine water is either pumped or drained into the Monongahela River Basin. A conservative estimate of the number of sources of acid mine drainage in the Monongahela Basin in West Virginia is 4,000. This figure does not include other sources of this type of pollution such as refuse piles and sludge ponds. In order to alleviate the problem of acid mine drainage, each of these sources must be located and separately studied. Possibly one-tenth of these pollution sources are located in easily accessible areas. As is well known, boreholes and mine drainage locations are normally located with respect to the underground strata rather than with respect to the surface terrain. To further complicate the problem, mining has been underway in this area for about 150 years, and records kept in the past are meager, to say the least. Perhaps the most frustrating fact about this whole problem is that no economically feasible method of treatment has yet been devised.

The State of West Virginia has embarked upon a program to alleviate this problem with respect to active mining operations and abandoned strip mining operations. First, the State has adopted ORSANCO Resolution No. 5-60 (Acid Mine Drainage Control Measure) and the State Water Resources Board has passed Resolution No. 2-63 (see appendix

Two) also dealing with acid mine drainage. The Division of Reclamation, Lands, and Surveys, State Department of Natural Resources in cooperation with the Department of Mines, is now directing all surface mining operations in the State with respect to actual mining, surface drainage, stream pollution, backfilling and land reclamation. In addition, money is being obtained from the present strip mine operators to reclaim areas stripped before the present laws were in effect and were being properly enforced. The State Division of Water Resources is in the process of obtaining all available information, with regard to acid mine drainage, from all active deep mines in the State. Several companies have already constructed waste treatment facilities to control the effluents pumped from their mines. These facilities, for the most part, consist of large ponds or lagoons. The iron in the acid mine drainage settles out in the lagoon and the relatively clear effluent is directed to the stream as an equalized flow over a 24-hour period. These lagoons treat the acid mine drainage in several ways: first, the iron is taken out of solution to a considerable extent, thus alleviating the problems of sludge and color in the receiving stream; second, most mine effluents are pumped only during off-peak hours. This causes a slugging effect in the stream if an equalizing lagoon is not used. Third, it appears that for some unknown reason, the effluents from the lagoons over a period of time have a higher pH value with less acidity and less sulfates than the acid mine water that is being pumped into the lagoons; and fourth, the mine water is out of the mine and in containment where, if chemical or biological treatment is found feasible, it can be readily achieved.

The State Legislature has appropriated $20,000 for a mine sealing project on the Snowy Creek-Laurel Run tributaries of the Youghiogheny River. This allocation was made after the Division of Water Resources, Department of Mines, the State of Maryland and other interested parties had made several surveys in the area. The Department of Mines recommended an allocation of $20,500. This was based on 40 openings which could be sealed at a cost of $500 each and 4 boreholes which could be sealed at a cost of $125 each. However, it is felt that the $20,000 would easily relieve the problem, if not completely correct it.

The Town of Lumberport in Harrison County, West Virginia is an example of the work that we have been doing in the field of acid mine drainage control and of some of the problems that we face. Lumberport for many years has used Jones Creek as a source of raw water for the Town. Jones Creek had been grossly polluted with acid mine drainage from strip as well as deep mines. The water was hard, high in iron and sulfates, had a low pH and contained a large amount of suspended solids. The town engaged a consulting engineer. The engineer recommended a site on Nolans Run, a tributary of Jones Creek. The town applied for and received a Federal grant-in-aid to assist with financing construction of a reservoir on Nolans Run. Before the construction of the reservoir could be initiated, however, a coal company began work to open a deep mine. The drainage from the mine along with that of old workings would drain into the reservoir. The Water Resources Board held a hearing on the matter and the company agreed to open the mine in an area below the proposed water supply reservoir. It was then felt that the problem had been solved, but then another coal company with mineral rights and coal in the watershed has since informed this office and the Town of Lumberport that they intend to strip the entire watershed with the exception of 61 acres. This latest development has not yet been resolved. The State is plagued with problems of this nature. These situations, possibly minor instances in their overall contribution to the acid mine drainage problem, are still very acute to the people of the town or area involved. The State feels that problems of a local nature such as this example or related problems that are indeed caused by active mining operations should and can be handled by the Division of Water Resources. However, the problem of abandoned mines and subsequent drainage therefrom into the streams can only be handled by the State with substantial Federal aid. The amount of aid is not exactly known but it is felt that the cost of sealing abandoned mines will run into millions of dollars.

We are, at this time, spending about $8,000 a year on our acid mine drainage pollution control program. This is a meager amount of funds considering the size of the problem and the areas involved. We are hopeful that more moneys will be made available for the acid mind drainage control program. However, we do not feel that our other pollution control programs should suffer for the betterment of this particular one.

Industries Other Than Coal

The program in this case is somewhat different from the coal industry in that no Inspector is assigned to carry out periodic inspections. Industrial plants are dealt with directly by the Charleston office. In most cases the action has been prompt and favorable whenever a plant is contacted and treatment requested.

There are 13 industrial installations (other than coal) in the Monongahela Basin in West Virginia which are considered of importance in the field of pollution abatement. Of this number all but three are considered as having adequate waste disposal facilities. Of the three inadequate plants, one is in the process of construction of waste treatment facilities, one is planning waste treatment and the other one has a minor solids problem which must be solved. Table V shows the status of each industry in the basin.

(Table V is as follows:)

Table V

Status of Industry Other Than Coal - Monongahela Basin

Company	Location	Type Industry	Type Treatment	Serving Stream	Status
Armour Leather Company	Parsons	Tannery	Clarifier, lagoons	Black Fork of Cheat River	Satisfactory
Carnation Company	Clarksburg	Milk canning	Aeration Tank and Biological Filter	Limestone Run	Satisfactory
Gerhart Refractories	Buckhannon	Refractory Manufacturing	Settling Basin	Fink Run of Buckhannon River	Satisfactory
Deckers Creek Sand Company	Morgantown	Sand	Filtration	Deckers Creek	Satisfactory
Dorman Mills	Parsons	Textile	Planning	Black Fork of Cheat River	--
McNichol Pottery Company	Clarksburg	Pottery	No plans, questionable load	Elk Creek	--
Matthiessen & Hegeler	Spelter	Metal Refining	Settling Basins	West Fork River	Satisfactory
Monongahela Power Company	Albright	Electric Power	Settling Basins	Cheat River	Satisfactory
Monongahela Power Company	Rivesville	Electric Power	Settling Basins	Monongahela River	Satisfactory
Preston County Coke Company	Cascade	Electric Power	Settling Tanks	Deckers Creek	Satisfactory
Reilley Tar & Chemical Corporation	Fairmont	Chemical-Tar Recovery	Settling Basins under Construction	Monongahela River	--
Sharon Steel Company	Fairmont	Chemical-Coking	Lagoon	Monongahela River	Satisfactory
Sterling Faucet Company	Morgantown	Metal Plating	To City System	Deckers Creek	Satisfactory

B. Wright

Percentagewise, 77 percent of the industrial installations have adequate treatment facilities. If due consideration is given to construction, 85 percent of the industrial installations (other than coal) have treatment facilities in operation or under construction. This is considered to be satisfactory progress.

As is generally the case, localized problems arise on occasion at most industries. These problems may be due to process changes, improper operation of waste disposal facilities or increases in production. In these cases, members of the Charleston office visit the plants in question to discuss the problem with management and try to hasten the solution to the problem.

WATER RESOURCES PROJECTS

Water resources development to date has occurred in the Monongahela River Basin primarily due to the efforts of the U.S. Army Corps of Engineers and the Soil Conservation Service. These projects and their status are shown in Table VI.

(Table VI is as follows:)

Table VI

Water Resources Development Projects In The Monongahela River Basin By The U.S. Army Corps of Engineers And The Soil Conservation Service

U. S. Army Corps of Engineers Projects

Project	Status	Description
Deckers Creek Survey	Study Underway	Local Flood Protection
Morgantown Lock and Dam (Monongahela Navigation Project)	Completed	Navigation structure on the Monongahela River
Hildebrand Lock and Dam (Monongahela Navigation Project)	Completed	Navigation structure on the Monongahela River which replaced Locks & Dams 12 & 13
Opekiska Lock and Dam (Monongahela Navigation Project)	Under Construction	Navigation structure on the Monongahela River to replace Locks & Dams 14 & 15
Bingamon Creek at Wyatt (Clearing and Snagging Project)	Completed	Clearing and snagging, Channel Improvement
Tygart Reservoir	Completed	Reservoir for flood control and water supply for navigation on the Monongahela River
Nutter Fort and Stonewood (Clearing and snagging project)	Completed	Clearing and snagging, Channel Improvement
Stonecoal Creek at Weston (Clearing and snagging project)	Completed	Clearing and snagging, Channel Improvement
Polk Creek at Weston (Clearing and Snagging Project)	Completed	Clearing and snagging, Channel Improvement
West Fork River Reservoir	Authorized	Flood Control Reservoir
Buckhannon local protection project	Authorized	Improve channel and provide cut-off channel
Elkins local protection project	Completed	Local flood protection by dikes and cut-off channel

Table VI (cont'd.)

Soil Conservation Service Projects

Watershed Name	Location (Counties)	Size (Acres)	Status	Remarks
Upper Deckers Creek	Preston, Monongalia	19,940	Planning	As of July 1963 the work plan was approved by the U.S. Senate and not as yet before the House.
Packs Run	Upshur, Barbour	8,210	Planning	As of July 1963 the work plan was approved by the U.S. Senate and not as yet before the House.
Salem Fork	Harrison	5,325	Operational	Project completed and is now in maintenance status
Polk Creek	Lewis	7,250	Operational	Initial construction began in 1962 - 5 year plan.

B. Wright

In summarizing this table there are 16 projects; 8 completed, 2 under construction, 4 under study, and 2 authorized. According to our files there have been 8 reports made by the Department of Health, Education and Welfare concerning the pollution and water quality in the Monongahela River and its tributaries.

The Division of Water Resources has made several studies in the Monongahela River Basin. Table VII lists 14 of these reports.

(Table VII is as follows:)

Table VII

Reports Made By The Division Of Water Resources In The Monongahela River Basin

1.	A Survey of the Mine Drainage in the West Fork Basin	1930
2.	Report on Pollution Survey of the West Fork River Basin	1930
3.	Report on Pollution Survey of Cheat River Basin	1930
4.	Report on Re-survey of Cheat River Basin	August, 1930
5.	Cheat River Survey	December, 1936
6.	Report on an Acid Mine Pollution Survey of the Tygart River Basin	March, 1938
7.	Acid Survey of the Tygart River	March, 1939
8.	Sewage Conditions in Weston Area	December, 1941
9.	Stream Conditions in the Weston Area	November, 1946
10.	Stream Conditions in the Elkins Area	November, 1948
11.	Stream Conditions in the Clarksburg Area and Pollution Affecting Same	March, 1949
12.	Lake Lynn - An Outline of Conditions	January, 1952
13.	Report on Jones Creek Watershed and Town of Lumberport Water Supply Reservoir	July, 1960
14.	Report on the Acid Mine Water Problem in the Snowy Creek-Laurel Run Area	May, 1961

B. Wright

You will note from this table that most of these studies are of localized conditions and not basin-wide in scope. They also are historical in nature and the conditions at the time of these studies would not necessarily hold true now. We have published recently three booklets statewide in scope. Two of these are water quality network reports of analytical data and the other is titled, "Water Resources of West Virginia." The report, "Water Resources of West Virginia, is the culmination of a two-year cooperative study between the United States Geological Survey and the West Virginia Water Resources Board. The report has attempted to evaluate the quality of water and the ground and surface water resources in West Virginia and it includes a specific section on pages 31-90 inclusive on the Monongahela River Basin. A summary of chemical analyses is given on pages 88 and 89. Currently, another cooperative study between the same parties is being made. By the end of fiscal year 1965 the Division of Water Resources should be ready to publish detailed water resources reports on the Monongahela River Basin. This may be in the form of two reports; one on the Monongahela River Basin, less the Cheat River System, and the other on the Cheat River Basin.

For the past three and one-half years, the Division has been running a statewide water quality network in which

B. Wright

there are eleven sampling points within the Monongahela River Basin. At most of these stations 30 to 40 samples have been analyzed. Table VIII gives the extremes and average conditions at the eleven points within the basin.

(Table VIII is as follows:)

Table VIII

Summary Of Water Quality Data In The Monongahela River Basin

Sample Point Location		Temp. (°C)	D.O. (ppm)	pH	5-day BOD (ppm)	Total Alk. (ppm as $CaCO_3$)	Hardness (ppm as $CaCO_3$)	Sulfates (ppm)	Chlorides (ppm)	Turbidity	SOLIDS		
											Susp. (ppm)	Diss. (ppm)	Total (ppm)
Cheat River at Albright MC-18(30.2)	Max.	30	14.0	7.5	3.7	40	60	82	10	450	670	123	715
	Min.	0	6.5	5.6	0.1	3	8	0	0	1	1	10	12
	Ave.	13	9.8	6.5	1.4	15	29	11	3	13	36	49	84
Shavers Fork at Cheat Br. MCS-46(63.5)	Max.	25	13.3	8.6	3.2	34	82	10	3	45	153	39	187
	Min.	0	6.9	4.3	0.0	0	10	0	0	0	1	3	10
	Ave.	11	12.2	6.8	1.2	14	23	1	1	7	19	24	43
Blackwater River at Hendricks MC-60-0-0 (0.2)	Max.	29	13.4	7.7	6.0	34	84	168	29	120	81	225	276
	Min.	0	6.4	3.5	0.0	0	6	0	0	0	3	3	10
	Ave.	11	9.7	4.9	1.2	10	36	41	3	16	19	77	99
Monongahela River below Morgantown M-6 (96.5)	Max.	28	13.9	6.7	4.6	17	242	625	12	1500	1629	538	1747
	Min.	0	4.6	3.3	0.0	0	4	10	0	2	1	24	86
	Ave.	15	9.2	4.7	1.1	6	134	219	5	56	84	244	330
Monongahela River at Fairmont M-24(127.4)	Max.	29	14.1	6.7	10.0	26	620	360	11	1200	970	794	1191
	Min.	0	5.0	3.3	0.1	0	4	5	1	1	1	29	90
	Ave.	14	9.1	5.0	1.9	8	135	168	5	52	63	234	307
West Fork River at Gypsy MW-14(20.0)	Max.	29	13.1	6.6	3.6	28	678	2688	25	1400	1382	1583	1819
	Min.	0	4.7	2.9	0.1	0	2	76	2	2	1	107	106
	Ave.	14	8.6	4.6	1.4	8	304	615	10	100	182	567	740
Tygart Valley River below Grafton MT-9(18.8)	Max.	28	14.3	7.0	9.7	21	104	110	8	190	216	234	1395
	Min.	0	2.9	3.5	0.0	0	20	0	0	0	0	12	17
	Ave.	13	10.2	5.5	1.3	9	42	31	2	13	24	75	131

Table VIII (cont'd.)

Sample Point Location		Temp. (°C)	D.O. (ppm)	pH	5-day BOD (ppm)	Total Alk. (ppm as $CaCO_3$)	Hardness (ppm as $CaCO_3$)	Sulfates (ppm)	Chlorides (ppm)	Turbidity	SOLIDS Susp. (ppm)	SOLIDS Diss. (ppm)	SOLIDS Total (ppm)
Buckhannon	Max.	27	14.0	7.6	3.8	33	106	77	8	220	226	153	259
River at Hall	Min.	0	5.9	4.6	0.1	5	10	0	0	1	1	2	10
MTB-5(7.5)	Ave.	13	9.5	6.3	1.1	11	31	15	3	15	34	54	87
Middle Fork	Max.	26	14.7	7.3	3.3	31	146	53	9	250	357	72	368
River at	Min.	0	6.2	5.3	0.1	2	6	0	0	0	1	4	4
Audra	Ave.	13	9.8	6.4	0.8	11	18	7	2	13	22	27	48
MTM-0(2.5)													
Tygart Valley	Max.	28	14.1	7.0	3.3	33	122	147	8	430	331	291	379
River at	Min.	0	5.6	3.7	0.0	0	20	0	1	1	1	20	39
Belington	Ave.	14	9.8	5.6	1.1	12	55	42	3	23	36	99	139
MT-35 (62.3)													
Tygart Valley	Max.	28	14.0	8.1	6.7	52	172	154	6	100	132	91	195
River above	Min.	0	6.6	6.1	0.1	9	6	0	0	0	1	8	16
Beverly	Ave.	14	9.9	6.9	1.4	29	37	10	2	9	15	48	63
MT-54(96.2)													

Note: Sample point numbers indicate location of sampling point. (Example MTB-5(7.5))

M - Monongahela River
T - Tygart Valley River, tributary to Monongahela River
B - Buckhannon River, tributary to Tygart Valley River
5 - Between the 5th and 6th named stream emptying into Buckhannon River above its mouth
(7.5) - Distance in miles above the mouth of the Buckhannon River to the sampling point

B. Wright

The samples were collected approximately once a month and no attempt has been made to statistically control the results.

It is the plans of this Division to revise the water quality network, having less sample points in the basin, collecting samples at extreme flow conditions and one collection at normal flow conditions, and broaden the analytical determinations which will be made on each sample.

(Table D is as follows:)

Table IX

List of Public Health Service Reports In The Monongahela River Basin

1.	Monongahela River Basin	January, 1942
2.	West Fork River Investigation	December, 1947
3.	Allegheny-Monongahela River Basin Memorandum Report	July, 1949
4.	Statement on Interstate Pollution Monongahela River Basin	January, 1953
5.	West Fork River Investigation	August, 1954
6.	Summary Report on Quality of Interstate Waters Monongahela River	December, 1958
7.	Report on Water Resources Study - Rowlesburg Reservoir Cheat River Basin, West Virginia and Pennsylvania	August, 1963
8.	Investigation of Interstate Pollution from West Virginia in the Monongahela River Basin	November, 1963

SUMMARY

The State Water Resources Board and the Division of Water Resources of the Department of Natural Resources do not deny that pollution exists in the Monongahela River Basin. The technical staff of the Water Resources Division is quite small in number and is spread thinly over the State. The Division staff believes, however, that there is no pollution in the Monongahela Basin which cannot be solved by the State pollution control authority if the funds and personnel were adequate to make investigations, prove pollution, work up reports for hearings, review and approve plans, issue permits, police for violations and tend to the myriad other details that always accompany enforcement action.

The biggest problem in the Monongahela drainage basin is that of acid mine drainage. West Virginia is committed to the acid mine drainage control measures adopted by the Ohio River Valley Water Sanitation Commission. Acid drainage from abandoned mines is not covered in these control measures and it may well be that additional studies will be required before a solution to the problem is found. It has been estimated by one source that it will require probably $3,200,000 to seal the present number of existing abandoned mine openings in West Virginia. It will, of course, require more than this to do the overall job since these openings must first be located and the water analyzed. It is highly unlikely that the State of West Virginia can ever come up with an appropriation of this enormity, and there the problem lies.

Programs for the control of other forms of pollution are in effect now and can lead to the solution of pollution problems by the State agency.

A complete new bill designed to strengthen the enforcement procedures in water pollution control in West Virginia is being prepared by the Legislative Joint Interim Committee on Water Pollution Control for introduction at the 1964 session of the West Virginia Legislature. This bill, if passed, will revolutionize water pollution control practices and enforcement in West Virginia. There is only one serious drawback and that is the extra funds and personnel it will require to administer it if it becomes law.

Thank you.

(Appendices One and Two are as follows:)

appendix Osil

STATE OF WEST VIRGINIA
STATE WATER COMMISSION
1709 WASHINGTON STREET, EAST
CHARLESTON 1, WEST VIRGINIA
TELEPHONE DICKENS 3 - 6151

MINIMUM WATER QUALITY OBJECTIVES

The following resolution was adopted by the State Water Commission on February 16, 1954 and amended on April 16, 1959 to conform with objectives of the Ohio River Valley Water Sanitation Commission. Specifications for classification of West Virginia Streams, which had been adopted in 1947 and amended in 1949 were rescinded on February 16, 1954.

RESOLUTION

Whereas, The State Water Commission, under Chapter 16, Article 11, Code of West Virginia has the power to determine whether any person, firm, municipality or corporation is polluting any of the waters of the state and to prevent, control, eliminate or reduce such pollution; and

Whereas, In order to make such determination, due consideration must be given to the amount and effect of the practicality and physical and economic feasibility of eliminating, controlling or reducing such pollution, the health and welfare of the public and other present and future uses of the waters of the state; and

Whereas, The State Water Commission recognizes that each stream in the state may present a separate problem; and

Whereas, The State Water Commission recognizes the propriety of using a watercourse for dilution of wastes so long as the net results are within the water quality objectives of the Commission for the stream in question; and

Whereas, The State Water Commission is of the opinion that certain characteristics of sewage, industrial wastes or other substances or factors which render waters directly or indirectly detrimental to the public health or unreasonably and adversely affect such waters for present or future uses, are objectionable in any of the waters of the state; now, therefore,

Be it Resolved:

That the State Water Commission adopt as a general guide the following minimum water quality objectives, applicable to all waters of the state, that is to say:

No sewage, industrial wastes or other substances allowed to enter any of the waters of the state shall cause therein or materially contribute to any of the following conditions thereof:

(1) Distinctly visible floating or settleable solids, scum, foam or oily sleeks of unreasonable kind or quantity;

(2) Objectionable bottom deposits or sludge banks;

(3) Objectionable odors in the vicinity of the waters;

(4) Objectionable taste or odor in municipal water supplies;

(5) Poisonous to man, animal or fish life;

(6) Dissolved oxygen concentration to be less than 3.0 parts per million at the point of maximum oxygen depletion;

(7) Objectionable color;

(8) Requiring an unreasonable degree of treatment for the production of potable water by modern water treatment processes as commonly employed; and, be it

Further Resolved, That with respect to sewage under the control of any municipal or private corporation, any county court, government institution, agency or political subdivision, these objectives be interpreted to require at least sufficient treatment to provide substantially complete removal of settleable solids and removal of not less than 45 per cent of the total suspended solids, and, be it

Further Resolved, That chlorination of sewage treatment plant effluents will be required where deemed necessary, and, be it

Further Resolved, That nothing contained herein shall be construed to be antagonistic to or interfere with the obligations incurred by the State of West Virginia as a signator to the Ohio River Valley Water Sanitation Compact; and, be it

Further Resolved, That higher or additional water quality objectives may be established by the Commission at its discretion, or exceptions may be made to these objectives in individual cases where justified.

Appendix Two

State of
West Virginia
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RESOURCES
1709 WASHINGTON ST., EAST · CHARLESTON 1, W. VA. · TEL.: 343-4411, EXT. 2107

STATE WATER RESOURCES BOARD

Resolution No. 2-63
Adopted October 24, 1963

ACID MINE DRAINAGE CONTROL MEASURE

WHEREAS: Certain acid mine drainage control measures were adopted by the Ohio River Valley Water Sanitation Commission and promulgated as Resolution No. 5-60, as amended January 10, 1963; and

WHEREAS: The State of West Virginia is a member of the Ohio River Valley Water Sanitation Compact and as such has agreed to carry out the control measures so established; and

WHEREAS: Waters of the State of West Virginia are being polluted by acid discharges from coal mining and related operations, hereinafter referred to as "Acid Mine Drainage", contrary to the language and intent of the State Water Pollution Control Law; and

WHEREAS: It has been demonstrated that the conscientious application of certain principles and practices will, under certain conditions, alleviate the pollution from acid mine drainage;

NOW THEREFORE: In furtherance of the policy and procedures of the State Water Resources Board;

BE IT RESOLVED: That the following measures are hereby adopted by the Water Resources Board for the control of acid mine drainage pollution in the State of West Virginia:

I. (a) Surface waters and ground waters shall be diverted where practicable to prevent the entry or reduce the flow of waters into and through workings.

(b) Water that does gain entry to the workings shall be handled in a manner which will minimize the formation and discharge of acid mine drainage to streams.

II. Refuse from the mining and processing of coal shall be handled and disposed of in a manner which will minimize discharge of acid mine drainage therefrom to streams. Where acid-producing materials are encountered in the overburden in stripping operations, these materials shall be handled so as to prevent or minimize the production of acid mine drainage, taking into consideration the need for stream pollution prevention and all economic factors involved.

III. DISCHARGE OF ACID MINE DRAINAGE TO STREAMS SHALL BE REGULATED INSOFAR AS PRACTICABLE TO EQUALIZE THE FLOW OF DAILY ACCUMULATIONS THROUGHOUT A 24-HOUR PERIOD.

IV. UPON DISCONTINUANCE OF OPERATIONS OF ANY MINE ALL PRACTICABLE MINE-CLOSING MEASURES, CONSISTENT WITH SAFETY REQUIREMENTS, SHALL BE EMPLOYED TO MINIMIZE THE FORMATION AND DISCHARGE OF ACID MINE DRAINAGE.

V. UNDER APPROPRIATE CIRCUMSTANCES, CONSIDERATION SHALL BE GIVEN TO THE TREATMENT OF ACID MINE DRAINAGE BY CHEMICAL OR OTHER MEANS IN ORDER TO MITIGATE ITS POLLUTIONAL PROPERTIES.

NOTHING STATED IN THIS CONTROL MEASURE SHALL BE CONSTRUED TO RELIEVE ANY MUNICIPALITY, CORPORATION, PERSON OR OTHER ENTITY FROM RESPONSIBILITY FOR COMPLIANCE WITH EXISTING FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

MR. STEIN: Thank you very much, Mr. Wright, for a comprehensive and certainly analytical statement.

Has the panel some questions or comments?

(No response.)

MR. STEIN: I just have one comment, and I think I am a little heartened by your figure.

If the figure -- and I don't agree with your analysis in money -- but if the figure in West Virginia is in the neighborhood of $3,200,000 or a little more, we have to contrast that with what, for example, St. Louis just spent, $95 million, in the Kansas City area $100 million, $100 million in the Washington, D. C., area, or your Allegheny County area.

In other words, for the benefits to be gained, wherever the funds are coming from, this is a figure which does seem outrageous for the benefits which may be received.

MR. WRIGHT: I would just like to caution the Chairman that we are not basing this on actual experience.

MR. STEIN: That's right.

MR. WRIGHT: It is a ball park figure.

MR. STEIN: It is a ball park figure, but it is so much lower than some of the other figures. I am sure that if we stay anywhere within the ball park, it looks like it might be a bargain.

Thank you very much.

(Applause.)

MR. STEIN: This completes the State and the interstate agency's presentations. Tomorrow we will have the presentation of the Department of Health, Education, and Welfare, and such additional people as may get in touch with Dr. Wilbar. Of course, there may be someone here from the State of New York who will make a very brief statement. Then, of course, possibly one of the most interesting parts will follow. It has been noted that the technical staff of ORSANCO and the States may want to question Mr. Sidio, who is presenting our points in the report of the Federal Government. Then, of course, we will attempt to have the discussion and the summary, which always proves to be interesting.

We expect to start promptly at 9:30, and, if we keep our noses to the grindstone, we may get you out somewhere about noon. At least, we hope to get you out for lunch, and not too late a lunch at that.

We will stand in recess until 9:30 tomorrow.

(Whereupon, at 5:10 p.m., the conference recessed until 9:30 a.m., Wednesday, December 18, 1963.)